DEPARTMENT OF HEALTH AND SOCIAL SECURITY

Reports on Public Health and Medical Subjects

No. 128

The Incidence and Causes of Blindness in England and Wales 1963-68

With an appendix on services available for incipient blindness

LONDON

HER MAJESTY'S STATIONERY OFFICE

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The Incidence and Causes of Blindness in England and Wales 1963-68

With an appendix on services available for incipient blindness

by

Arnold Sorsby

LONDON
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PREFACE

This report completes the study of the incidence and causes of blindness in England and Wales undertaken by Professor Arnold Sorsby in association with the Department during the twenty years 1948–68, the years 1948–62 having been dealt with in earlier reports. It must not be forgotten, however, that it orginally began in 1933 under the auspices of the Medical Research Council; in all, therefore, it covers a period of 36 years. Taken as a whole this has been a monumental undertaking.

During this time nearly 150,000 complex blind certificates were completed by consultant ophthalmologists and transmitted to the local authority, which then sent copies to this Department for analysis. That so many people have been willing to take so much trouble over so long a period says much for the quality of Professor Sorsby's work, and for its value to the profession. By the same token the work could not have been undertaken without this collaboration, and I should like to take the opportunity of thanking all who have contributed to make it possible. To Professor Sorsby is owed a debt of special gratitude.

The information in the present report has been set out in such a way as to enable the best possible use to be made of it in the prevention and treatment of blindness. It will be valuable also to those who deal with the complex personal and social problems of the blind and partially sighted. The retrospective study of the services available for incipient blindness in Greater London (Appendix III) shows that there is much room for improvement in the way in which these very human issues are handled.

This report is also the last in the series on Public Health and Medical Subjects, begun in 1920 and commonly known as Grey Books. The series has been replaced by a new one of Reports on Health and Social Subjects.

G. E. GODBER,

Chief Medical Officer.

ACKNOWLEDGEMENTS

For the blind certificates on which the report for 1963–68 is based I am obliged to the Medical Officers of Health throughout the country, to Miss M. Henham-Barrow, Mrs. M. J. Warriner and Mrs. F. E. Spencer of the Southern, the Northern and the Western Regional Associations for the Blind, and to Dr. A. R. Culley, lately of the Welsh Board of Health. Mr. M. S. Colborne Brown of the Royal National Institute for the Blind has helped with data on the Sunshine Homes for Blind Babies and Dr. B. Benjamin with statistical assessments.

For Appendix III dealing with medical and social services in incipient blindness, I am indebted to Mrs. R. Ann Abel for carrying out the work of the survey.

I am obliged to Mrs. J. M. Blackburn, J.P. and Miss E. M. Gower for their ready help throughout the preparation of this report.

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ANALYSIS

1 Scope of analysis

Data extracted from 135,707 certificates on blindness (BD8 forms) have been analysed in a series of publications covering fairly fully the 30 years between 1933 and 1962 (Sorsby, 1950, 1953, 1956, and 1966). The present study analyses the data from a further 13,718 certificates received during the six years 1963–1968, provisional brief summaries of which have been recorded in the Chief Medical Officer's Annual Reports (Ministry of Health, 1964, 1965, 1966, 1967, 1968; Department of Health and Social Security, 1969).

The analyses for the years up to 1960 covered blindness at all ages. The present study, like those for 1961 and 1962, excludes those over the age of 65 years. This procedure was adopted partly for administrative reasons but mainly because the causes of blindness in the elderly population are fairly well known and it seemed more useful to analyse in greater depth the causes of blindness during the active years of life.

2 The Blind Register

The number of blind

Altogether 76,808 persons were newly registered as blind during the six years 1963–68, the number for each year except the first being around 13,000.

Age and sex distribution

The registered blind population is preponderantly elderly. The following summary table for 1968 based on Tables 1 and 2 is illustrative:—

Age group (years)	*0–15*	*16–49*	*50–59*	*60–69*	*70 and over*	*All known ages*
New registrations	267	694	719	1,903	9,373	12,956
Blind population	2,133	12,040	9,182	16,623	62,715	102,693

It is noteworthy that since 1964, in the age group 70 years and over (which contains the bulk of registrations), those aged 70–79 have contributed fewer both to new registrations and to the blind register than those aged 80 and over. Among new registrations those aged 90 and over are now contributing almost as many as all age groups up to 50 (821 and 961 respectively in 1968). The steepest increase both in new registrations and in the blind population is for the age groups 85–89 and 90 and over.

The incidence of blindness in childhood is relatively high, but declines in early adult life; subsequently it increases steadily with age. This is brought out in Table 3, which shows the age distribution of the newly registered blind in 1963–68 set against that of the sample census of the general population in 1966; the age groups 16 to 20 and 70 and over each constituted 7·8 per cent of the general population, but contributed respectively 0·5 and 72·3 per cent of the new registrations.

TABLE 1

New registrations in England and Wales: 1963–68. By age and sex

Registered during the year ending 31 December	AGE GROUP (years)															Total
	Under 1	1–4	5–15	16–20	21–29	30–39	40–49	50–59	60–64	65–69	70–79	80–84	85–89	90 and over	Not known	
1963																
Males	16	66	58	36	61	117	168	337	303	395	1,383	737	453	131	2	4,263
Females	14	50	57	21	31	71	139	378	388	653	2,455	1,590	1,058	408	4	7,317
Persons	30	116	115	57	92	188	307	715	691	1,048	3,838	2,327	1,511	539	6	11,580
1964																
Males	16	56	59	39	53	103	177	333	352	428	1,503	895	570	151	2	4,737
Females	20	65	48	22	45	71	158	391	438	701	2,732	1,821	1,331	505	3	8,351
Persons	36	121	107	61	98	174	335	724	790	1,129	4,235	2,716	1,901	656	5	13,088
1965																
Males	20	76	64	48	55	117	166	343	342	468	1,403	794	585	165	2	4,648
Females	9	39	59	25	42	66	137	392	448	650	2,641	1,797	1,320	541	6	8,172
Persons	29	115	123	73	97	183	303	735	790	1,118	4,044	2,591	1,905	706	8	12,820
1966																
Males	20	79	66	49	56	109	151	340	306	435	1,534	842	593	237	3	4,820
Females	10	67	55	24	42	79	138	427	419	702	2,789	1,864	1,347	562	7	8,532
Persons	30	146	121	73	98	188	289	767	725	1,137	4,323	2,706	1,940	799	10	13,352
1967																
Males	15	65	60	37	71	119	199	316	308	461	1,495	826	580	202	3	4,757
Females	13	60	51	19	44	58	149	386	414	708	2,659	1,767	1,317	581	10	8,236
Persons	28	125	111	56	115	177	348	702	722	1,169	4,154	2,593	1,897	783	13	12,993
1968																
Males	16	70	56	45	79	99	186	338	314	488	1,439	834	535	175	9	4,683
Females	19	55	51	21	49	61	154	381	425	676	2,574	1,775	1,395	646	10	8,292
Persons	35	125	107	66	128	160	340	719	739	1,164	4,013	2,609	1,930	821	19	12,975

TABLE 2

Registered blind population in England and Wales: 1963–68. By age and sex

Blind population at 31 December	AGE GROUP (years)														Total
	Under 1	1–4	5–15	16–20	21–29	30–39	40–49	50–59	60–64	65–69	70–79	80–84	85–89	90 and over	Not known	
1963																
Males	4	178	1,057	551	1,122	2,001	3,443	5,143	3,242	3,927	9,243	4,621	3,019	1,214	11	38,776
Females	7	125	864	374	776	1,330	2,585	4,763	3,714	5,219	16,293	9,930	7,585	4,119	12	57,696
Persons	11	303	1,921	925	1,898	3,331	6,028	9,906	6,956	9,146	25,536	14,551	10,604	5,333	23	96,472
1964																
Males	4	176	1,062	556	1,136	1,912	3,419	5,112	3,288	3,964	9,382	4,759	3,183	1,340	12	39,305
Females	9	153	840	395	776	1,301	2,519	4,701	3,840	5,213	16,548	10,331	8,092	4,480	9	59,207
Persons	13	329	1,902	951	1,912	3,213	5,938	9,813	7,128	9,177	25,930	15,090	11,275	5,820	21	98,512
1965																
Males	10	183	1,075	581	1,152	1,914	3,313	5,123	3,302	4,043	9,384	4,659	3,319	1,440	9	39,507
Females	5	157	804	441	785	1,283	2,449	4,682	3,773	5,266	16,686	10,490	8,604	4,864	11	60,300
Persons	15	340	1,879	1,022	1,937	3,197	5,762	9,805	7,075	9,309	26,070	15,149	11,923	6,304	20	99,807
1966																
Males	10	211	1,024	631	1,174	1,859	3,197	5,070	3,379	3,955	9,602	3,645	3,380	1,601	11	39,749
Females	2	163	820	481	763	1,273	2,427	4,602	3,832	5,284	16,952	10,803	8,838	5,267	17	61,524
Persons	12	374	1,844	1,112	1,937	3,132	5,624	9,672	7,211	9,239	26,554	15,448	12,218	6,868	28	101,273
1967																
Males	5	214	987	687	1,177	1,858	3,225	4,975	3,382	3,914	9,722	4,717	3,444	1,669	6	39,982
Females	7	167	791	518	785	1,251	2,432	4,493	3,817	5,339	17,079	11,055	9,265	5,603	13	62,615
Persons	12	381	1,778	1,205	1,962	3,109	5,657	9,468	7,199	9,253	26,801	15,772	12,709	7,272	19	102,597
1968																
Males	6	214	969	699	1,232	1,815	3,293	4,826	3,377	4,039	9,612	4,697	3,390	1,663	8	39,840
Females	6	160	778	533	829	1,211	2,428	4,356	3,865	5,342	16,945	11,252	9,355	5,801	29	62,890
Persons	12	374	1,747	1,232	2,061	3,026	5,721	9,182	7,242	9,381	26,557	15,949	12,745	7,464	37	102,730

A substantial sex difference in distribution is also seen. In the new registrations there is a consistent male excess in all age groups up to 50, when a steadily increasing reversal sets in; this leads to a marked overall female excess reaching, in the highest age group (90 and over), a ratio of more than 3 : 1.

3 The Blind Certificates

The certificates studied

During 1963–68 13,718 certificates of blindness in people under 65 were available for study—90·2 per cent of all newly issued certificates in this age group. As the sample available was in no way selected, and as the age distribution of available certificates (Table 4) agreed well with that in the national returns (Table 3), the material is considered adequate for analysis of the causes of blindness in the age groups under consideration.

4 Analysis of the Blind Certificates

The degree of blindness

Table 5 shows that, among those registered as blind, total blindness (no perception of light) is exceptional (4·9 per cent for males and 5·1 per cent for females): almost total blindness (perception of light) is more frequent (10·9 per cent for males and 10·4 per cent for females), but well over half those registered (53·7 per cent males and 55·7 per cent females) had some degree of useful vision (hand movements and vision up to 3/60), and 30·5 per cent of males and 28·8 per cent of females had central vision better than 3/60. The number who had vision better than 3/60 was therefore about double the number contributed by the totally and sub-totally blind. Thus the blind population taken as a whole is largely one afflicted with grossly defective vision rather than with blindness in the full sense of the term.

This, however, does not apply to children and young adults. Well over a quarter of registered infants under 5 years are recorded as totally blind, as are some 10 per cent of children registered at school age (5–14 years).

There is no consistent sex difference in the incidence of the various degrees of registerable blindness.

Blindness from the same cause in both eyes (Tables 6–14)

The material as a whole

Of the 13,718 certificates studied 13,242 (96·5 per cent) show blindness from the same cause in the two eyes. A detailed analysis of these 13,242 is shown in Appendix Tables I.A and I.B; the former table gives classification by aetiology, the latter covers topographical and clinical entities.

Topographical and aetiological data: From Table 6, based on Appendix Tables I.A and I.B, it will be seen that affections of the retina contributed more than a third of the total of cases, and those of the optic nerve and visual pathways a further 15·4 per cent; affections of the uvea and of the lens gave 17·9 per cent and 11·1 per cent respectively; corneal lesions as an exclusive cause of

TABLE 3

New Registrations: 1963–68

Age distribution compared with that of the enumerated population at the 1966 Census

Age group (years)	New Registrations						Census 1966		
	Males		Females		Persons		Males	Females	Persons
	No	%	No	%	No	%	%	%	%
Under 1	103	0·4	85	0·2	188	0·2	1·8	1·6	1·7
1–4	412	1·5	336	0·7	748	1·0	7·2	6·4	6·8
5–15	363	1·3	321	0·6	684	0·9	16·8	15·0	15·9
16–20	254	0·9	132	0·3	386	0·5	8·1	7·4	7·8
21–29	375	1·3	253	0·5	628	0·8	11·8	10·9	11·3
30–39	664	2·4	406	0·8	1,070	1·4	12·6	11·8	12·2
40–49	1,047	3·7	875	1·8	1,922	2·5	13·3	12·9	13·1
50–59	2,007	7·2	2,355	4·8	4,362	5·7	13·1	13·1	13·1
60–64	1,925	6·9	2,532	5·2	4,457	5·8	5·5	6·0	5·7
65–69	2,675	9·6	4,090	8·4	6,765	8·8	4·0	5·1	4·6
70 and Over	18,062	64·7	37,475	76·6	55,537	72·3	5·8	9·8	7·8
Not known	21	0·1	40	0·1	61	0·1			
All	27,908		48,900		76,808	100·0	100·0	100·0	100·0

TABLE 4

Age at registration shown in the certificates of blindness 1963–68 (limited age groups)

Age group (years)	Males		Females		Persons	
	No	%	No	%	No	%
Under 1	93	1·4	89	1·3	182	1·3
1–4	366	5·4	310	4·5	676	4·9
5–14	337	4·9	283	4·1	620	4·5
15–19	237	3·5	135	2·0	372	2·7
20–29	410	6·0	277	4·0	687	5·0
30–39	647	9·5	385	5·6	1,032	7·5
40–49	1,007	14·7	836	12·1	1,843	13·5
50–59	1,860	27·2	2,183	31·7	4,043	29·5
60–64	1,877	27·4	2,386	34·7	4,263	31·1
Total	6,834	100·0	6,884	100·0	13,718	100·0

TABLE 5

Degree of blindness by age group and sex: 1963–68

(percentage distribution)

Percentage	AGE GROUP (years)																			
	Under 1		1–4		5–14		15–19		20–29		30–39		40–49		50–59		60–64		ALL AGES	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
No perception of light ..	28·8	47·1	20·1	23·7	10·4	10·8	6·7	7·1	8·9	7·4	5·3	7·0	3·1	5·1	2·7	3·6	2·7	1·9	4·9	5·1
Perception of light ..	56·2	44·1	45·3	45·1	17·4	21·5	10·4	12·1	8·4	7·4	7·2	7·1	7·6	9·4	9·0	7·9	8·4	8·1	10·9	10·4
Hand movements up to 3/60 snellen*	13·7	5·9	26·2	25·9	47·0	50·9	49·2	48·6	47·2	55·4	55·6	51·0	57·6	55·8	57·3	57·6	56·0	60·2	53·7	55·7
Better than 3/60 snellen*	1·3	2·9	8·4	5·3	25·2	16·8	33·7	32·2	35·5	29·8	31·9	34·9	31·7	29·7	31·0	30·9	32·9	29·8	30·5	28·8

*In children under 5 the degrees of vision are estimates only.

M = Males F = Females

TABLE 6

Blindness from the same cause in both eyes at all ages up to 65 years: 1963–68

Classification by site and by cause

Diagnosis	Number	Percentage
1. *By site of affection*		
Eyeball in general	1,963	14·8
Conjunctiva	30	0·2
Cornea	458	3·5
Lens	1,463	11·1
Uveal tract	2,374	17·9
Retina	4,672	35·3
Optic nerve, optic pathway and cortical visual centres	2,039	15·4
Vitreous	54	0·4
Globe normal	189	1·4
All	13,242	100·0
2. *By cause*		
Infectious diseases (excluding transmitted maternal infections)	170	1·3
Trauma	176	1·3
Poisonings	40	0·3
Tumours	523	3·9
Systemic diseases not elsewhere classified	3,391	25·7
Prenatal influences	3,156	23·8
Aetiology undetermined	5,786	43·7
All	13,242	100·0

blindness accounted for only 3·5 per cent. The cause remained undetermined in no less than 43·7 per cent of cases. Pre-natal influences were responsible in 23·8 per cent, systemic disorders in 25·7 per cent, and tumours—mostly intracranial—in 3·9 per cent of cases; infectious diseases (excluding transmitted maternal infections), trauma and poisonings contributed very little to the total.

Classification by clinical entities: Table 7 (based on Table I.B of Appendix I) shows that 14·2 per cent of cases were due to congenital defect, almost a third of these being cases of cataract. Diabetic retinopathy, myopic chorioretinal atrophy and detachment, and acquired optic atrophy were the outstanding blinding affections, with 15·7 per cent, 14·0 per cent and 12·6 per cent respectively. Glaucoma, cataract and uveitis (all of undetermined origin) gave 7·2 per cent, 6·6 per cent and 3·1 per cent respectively. Retinitis pigmentosa and allied affections (including macular dystrophy) accounted for 8·1 per cent of cases, and retinal detachment (unspecified) for 1·7 per cent. Retinopathy of vascular origin was present in 2·0 per cent and cerebro-vascular affections contributed a further 1·2 per cent.

Causes of blindness at different ages

The distribution of the causes of blindness which contributed more than 3·5 per cent of cases in any particular age group is summarized in Table 8 based on Table I.C (Appendix I). It will be seen that congenital anomalies were the leading causes in children up to 15, with optic atrophy, known or presumed to be acquired, a significant second cause. In the age group 15–29 these two causes were of fairly equal value, each contributing some 25 per cent of the cases; retinitis pigmentosa and allied abiotrophic disorders were responsible for 16·7 per cent of cases. Thus congenital anomalies, acquired optic atrophy (generally of undetermined origin) and abiotrophic disorders predominate in the age groups under 30.

Acquired optic atrophy, with 21·2 per cent, was the leading cause at 30–49 years, with retinitis pigmentosa and allied affections not far behind at 14·2 per cent. In this age group diabetic retinopathy and myopic chorioretinal atrophy emerged as substantial causes with 15·4 per cent and 11·5 per cent of cases respectively, and these affections continued to maintain their significant position in the higher age groups. Glaucoma and cataract became increasingly more important at 50 and over. Acquired optic atrophy continued to be a significant cause at the higher ages.

Sex differences in the causes of blindness

It has already been seen from Table 1 that new registrations comprise more males than females up to the age of 50, and more females than males after that age. Table 9 (based on Appendix Table I.D) shows the female incidence for the major causes adjusted to allow for the disproportion in the sexes at the different ages.

Overall differences. It will be seen from the last two columns of Table 9 that there is a significant male excess for congenital defects, optic atrophy, retinitis pigmentosa and glaucoma; in contrast there is a significant female excess for diabetic retinopathy, myopic chorioretinal atrophy, interstitial keratitis and cataract.

TABLE 7

Clinical classification: diseases and defects responsible for more than 0·5 per cent of cases: 1963–68

All ages by sex

Cause	Males			Females			Persons		
	No		%	No		%	No		%
Congenital defects:									
Globe:									
Nystagmus	62			44			106		
Albinism	24			25			49		
Anophthalmos	6			16			22		
Buphthalmos	60			38			98		
Microphthalmos	43			39			82		
Aniridia	17			26			43		
Coloboma	29			23			52		
Other structural defects	86			94			180		
Lens:									
Cataract	295			236			531		
Dislocations	25	1,016	15·5	35	862	12·8	60	1,878	14·2
Retina:									
Retinal aplasia and allied conditions	60			56			116		
Retinoblastoma	23			24			47		
Retrolental fibroplasia	49			49			98		
Other	16			13			29		
Optic Nerve:									
Optic atrophy	221			144			365		
Defects appearing in post-natal life:									
Myopic chorioretinal atrophy and detachment	779		11·9	1,075		16·0	1,854		14·0
Diabetic retinopathy	857		13·1	1,224		18·2	2,081		15·7
Optic atrophy (excluding congenital and genetic cases)	952		14·2	721		10·7	1,673		12·6
Retinitis pigmentosa and allied conditions	545		8·4	382		5·7	927		7·0
Macular dystrophy	59		0·9	84		1·3	143		1·1
Glaucoma	501		7·7	453		6·7	954		7·2
Cataract of undetermined origin	371		5·7	499		7·4	870		6·6
Uveitis of undetermined origin	180		2·8	234		3·5	414		3·1
Retinal detachment	121	5,511	1·9	98	5,853	1·5	219	11,364	1·7
Macular degeneration	177		2·7	205		3·1	382		2·9
Vascular retinopathy	146		2·2	114		1·7	260		2·0
Congenital syphilis:									
Interstitial keratitis	50		0·8	89		1·3	139		1·0
Disseminated choroiditis	5		0·1	5		0·1	10		0·6
Cerebro-vascular affections (excluding optic atrophy)	114		1·7	47		0·7	161		1·0
All other causes	654		10·0	623		9·3	1,277		9·1
Total		6,527	100·0		6,715	100·0		13,242	100·2

TABLE 8

Causes of blindness by age group (age at registration) and percentage distribution of causes contributing more than 3·5 per cent of cases: 1963–68

Cause	AGE GROUP (years)					
	0–4	5–14	15–29	30–49	50–59	60–64
	%	%	%	%	%	%
Congenital defects	70·0	54·1	25·3	8·6	4·6	2·2
Optic atrophy, known or presumed to be acquired and that of undetermined origin	9·9	19·3	25·0	21·2	9·8	5·7
Retrolental fibroplasia	6·3	4·1	—	—	—	—
Retinoblastoma	3·6	—	—	—	—	—
Retinitis pigmentosa and allied conditions including macular dystrophy	—	4·9	16·7	14·2	7·4	4·3
Diabetic retinopathy	—	—	6·0	15·4	19·3	20·8
Myopic chorioretinal atrophy	—	—	4·8	11·5	17·1	16·6
Uveitis	—	—	—	4·0	3·8	—
Glaucoma, primary	—	—	—	—	8·7	12·9
Cataract, presumed aged	—	—	—	—	7·2	11·8
All other	10·2	17·6	22·2	25·1	22·1	25·7
Total per cent	100·0	100·0	100·0	100·0	100·0	100·0

TABLE 9

The major causes of blindness by sex: 1963–68

Adjusted female incidence against actual male incidence in different age groups*

Cause	AGE GROUP (years)													
	0–4		5–14		15–29		30–49		50–59		60–64		All ages	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Congenital defect	359	310	201	164	158	127	119	123	93	76	47	41	928	790
Optic atrophy, known or assumed to be acquired	46	41	52	70	160	103	338	261	222	150	134	86	952	711
Retinitis pigmentosa and allied conditions including macular dystrophy	1	7	21	9	110	64	211	188	161	119	100	64	604	451
Diabetic retinopathy	—	—	—	—	40	22	281	149	267	454	269	497	857	1,125
Myopic chorioretinal atrophy	1	2	8	7	31	20	173	152	247	393	251	364	711	938
Uveitis of undetermined origin	1	1	7	8	16	15	61	53	59	84	36	59	180	220
Glaucoma	—	—	2	—	5	2	46	40	167	160	281	210	501	412
Cataract	5	5	1	1	6	6	42	49	139	133	178	259	371	453
Interstitial keratitis	2	1	—	—	3	2	12	14	16	38	17	27	50	82
All other corneal lesions	6	6	4	6	4	4	29	29	45	73	47	51	135	169
All other causes	22	22	25	20	72	39	192	116	224	210	263	224	797	631

*Method of adjustment: In each age group the female population blind from all causes, and from individual causes, was divided by the ratio Female : Male in the estimated home population for each of the mid-years to obtain comparable figures.

Differences in particular age groups. A striking finding is the male excess of diabetic retinopathy, and to a lesser extent of myopic chorioretinal atrophy, in the age groups 15–29 and 30–49 years, against a marked female excess for both those affections at 50–59 and 60–64. The female excesses for interstitial keratitis and cataract appear to be mainly confined to the two higher age groups.

Annual variations

Some major causes. Table 10 sets out the major causes of blindness by sex and age for the years 1963–1968. The annual fluctuations do not appear to be very wide. A more detailed assessment is attempted in Tables 11, 12 and 13.

Table 11 deals with three outstanding affections—glaucoma, myopic chorioretinal atrophy and diabetic retinopathy. The total number of cases for each of these causes in the blind population up to 65 years is computed by allowing for the missing blind certificates each year. No very consistent differences emerge.

Retrolental fibroplasia. The annual variations for retrolental fibroplasia are shown in Table 12. Some 10 cases a year are still being registered under the age of 5 and about 5 more during school life.

Some rates per 100,000. Table 13 gives the rates per 100,000 by sex at 0–14, 15–49, 50–59 and 60–64 years for the more significant causes. There is nothing to suggest any substantial movement over the years except possibly for diabetic retinopathy for which the overall picture suggests a stationary incidence, though 1968 shows a higher rate for women aged 60–64 years.

Blindness from a different cause in the two eyes (Tables 15–17)

Specifically unilateral causes

As can be seen from Appendix Table I.E only 476 of the newly registered aged 0–64 years showed a different cause of blindness in the two eyes. It will also be seen from Table 14 that whilst the total incidence is low, it increases with increasing age, almost half of all such cases being concentrated in the age group 60–64 years.

The incidence of specifically unilateral causes of blindness—trauma, ocular tumours and *amblyopia ex anopsia*—is shown in Table 15. It is noteworthy that these contributed only 33·7 per cent of blinded eyes, and that for both men and women trauma is the outstanding cause.

The total number of cases of *amblyopia ex anopsia* is very much the same for the two sexes (28 for men and 24 for women), but men have a substantially greater number of eyes blinded by trauma (202 as against 56 in women).

Table 16 shows the type of trauma. It would appear that the male excess for trauma results from a greater incidence of almost every type of listed injury.

Essentially bilateral causes

The occurrence in the same individual of two normally bilateral blinding affections, each responsible for blindness in one eye, was observed in 316 persons in this series, i.e. in 2·3 per cent of all the new registrations.

Sympathetic ophthalmia

As can be seen from Table 17 blindness resulting from sympathetic ophthalmia following surgery was strikingly absent. All the 27 cases recorded followed

TABLE 10

Annual variations: 1963–68

Distribution of major causes of blindness

Cause	MALES						FEMALES					
	1963	1964	1965	1966	1967	1968	1963	1964	1965	1966	1967	1968
Congenital cataract	50	53	56	57	35	44	32	47	44	36	34	43
Dislocated lens	4	3	5	3	2	8	5	7	6	5	6	6
Retinal aplasia	11	11	20	10	4	4	8	9	12	16	3	8
Optic atrophy, known or presumed congenital or hereditary	35	37	45	40	28	36	20	27	19	33	20	25
Other congenital structural anomalies including nystagmus	45	57	57	58	53	57	54	51	45	55	42	58
Retrolental fibroplasia	5	7	11	8	6	12	8	6	6	3	13	13
Retinoblastoma	4	2	9	4	4	—	3	4	2	3	6	6
Myopic chorioretinal atrophy	117	120	108	114	131	121	154	171	170	192	175	154
Detachment	13	16	7	20	1	11	17	10	12	16	—	4
Optic atrophy, known or presumed acquired	88	94	110	96	147	127	68	92	85	97	91	102
Optic atrophy of undetermined origin	49	52	38	50	54	47	31	23	29	40	33	30
Retinitis pigmentosa and allied conditions	113	82	87	86	73	104	56	70	65	71	52	67
Macular dystrophy	10	10	10	8	7	14	13	13	11	18	10	19
Uveitis of undetermined origin	25	29	25	39	35	27	39	45	43	47	18	42
Cataract other than congenital	39	60	67	61	72	72	61	87	84	70	92	105
Diabetic retinopathy	134	115	169	152	128	159	175	214	209	205	197	224
Glaucoma	76	78	98	83	88	78	68	63	79	82	85	76
Interstitial keratitis	8	7	3	15	11	6	15	17	10	13	21	13
All other corneal lesions	24	26	21	23	18	23	20	38	33	31	31	28
Detachment, presumed non-myopic	19	21	21	21	24	15	17	14	14	20	22	11
Vascular retinopathy	28	26	30	34	14	14	19	23	18	24	10	20
Ophthalmia neonatorum	—	1	—	—	2	—	1	—	6	2	3	2
Vitreous haemorrhage	2	6	6	7	5	5	5	4	2	4	3	5
All other causes	126	156	99	126	149	135	94	118	93	114	152	105
Total	1,031	1,069	1,102	1,115	1,091	1,119	983	1,153	1,097	1,197	1,119	1,166
	6,527						6,715					

TABLE 11

Annual variations: 1963–68

Adjusted data for the three outstanding causes

Year	Ratio for adjustment*		Glaucoma			Myopic chorioretinal atrophy			Diabetic retinopathy		
	M	F	M	F	P	M	F	P	M	F	P
1963	1·12	1·27	85	86	171	131	196	327	150	222	372
1964	1·11	1·09	87	69	156	133	186	319	128	233	361
1965	1·12	1·18	110	93	203	116	195	311	189	247	436
1966	1·05	1·02	87	84	171	120	196	316	160	209	369
1967	1·09	1·07	96	91	187	143	187	330	140	211	351
1968	1·07	1·04	83	79	162	129	160	289	170	233	403

*Adjustment by computing the ratio of certificates analysed to the total number of new registrations.

M=Males F=Females

TABLE 12

Annual distribution of retrolental fibroplasia by age and sex: 1963–68

Year	AGE GROUP (years)														
	Under 1		1–2		2–3		3–4		4–5		0–5			5–14		
	M	F	M	F	M	F	M	F	M	F	M	F	P	M	F	P
1963	1	1	1	1	—	2	—	—	—	1	2	5	7	3	1	4
1964	2	1	—	3	1	—	—	—	—	1	3	5	8	3	—	3
1965	3	3	2	—	—	—	—	—	—	—	5	3	8	5	3	8
1966	4	—	1	2	2	2	—	—	—	1	7	5	12	3	1	4
1967	3	2	1	3	—	—	—	—	—	1	4	6	10	2	5	7
1968	3	1	4	2	1	—	—	—	—	—	8	3	11	—	2	2
Total ..	16	8	9	11	4	4	—	—	—	4	29	27	56	16	12	28

This table shows 2 more cases at 0–5 years and 3 more at 5–14 years than are shown in Table I.C (Appendix I). These were added on re-assessment after additional information.

M=Males F=Females

TABLE 13

Rates per 100,000 for the major causes of blindness in their most relevant age groups: 1963–68

Glaucoma

Age group (years)	0–14			15–49			50–59			60–64		
Year	M	F	P	M	F	P	M	F	P	M	F	P
1963 ..	—	—	—	0·09	0·07	0·08	0·80	0·75	0·77	3·61	2·58	3·05
1964 ..	—	—	—	0·05	0·04	0·05	0·93	0·72	0·82	3·57	2·54	3·02
1965 ..	—	—	—	0·07	0·05	0·06	1·10	0·81	0·95	4·54	3·33	3·90
1966 ..	0·02	—	0·01	0·07	0·08	0·08	0·83	1·19	1·02	3·86	2·40	3·08
1967 ..	0·02	—	0·01	0·12	0·08	0·10	0·98	1·05	1·02	3·51	2·92	3·19
1968 ..	—	—	—	0·05	0·05	0·05	0·98	0·88	0·93	3·40	2·90	3·13

Myopic chorioretinal atrophy

Age group (years)	0–14			15–49			50–59			60–64		
Year	M	F	P	M	F	P	M	F	P	M	F	P
1963 ..	0·04	0·04	0·04	0·31	0·20	0·26	1·43	1·97	1·71	3·27	4·80	4·10
1964 ..	0·02	0·03	0·03	0·40	0·29	0·35	1·20	2·15	1·69	3·17	4·79	4·04
1965 ..	0·05	0·06	0·06	0·22	0·35	0·28	1·33	2·17	1·76	3·27	4·10	3·71
1966 ..	0·02	0·02	0·02	0·26	0·24	0·25	1·50	2·56	2·05	3·08	5·69	4·47
1967 ..	0·04	—	0·02	0·34	0·25	0·29	1·36	2·41	1·90	3·97	4·89	4·46
1968 ..	—	0·02	0·01	0·31	0·22	0·26	1·50	1·95	1·73	3·33	4·65	4·03

Diabetic retinopathy

Age group (years)	15–49			50–59			60–64		
Year	M	F	P	M	F	P	M	F	P
1963 ..	0·40	0·16	0·28	1·49	2·59	2·06	3·87	5·37	4·69
1964 ..	0·40	0·32	0·36	0·96	2·67	1·83	3·49	6·55	5·13
1965 ..	0·57	0·23	0·40	1·63	2·76	2·21	4·47	6·60	5·60
1966 ..	0·46	0·30	0·38	1·73	2·13	1·94	3·08	6·37	4·84
1967 ..	0·46	0·26	0·36	1·32	2·28	1·82	2·88	6·59	4·86
1968 ..	0·54	0·28	0·41	1·78	2·67	2·24	3·64	7·48	5·69

M = Males F = Females P = Persons

TABLE 13—continued

Hypertensive retinopathy

Age group (years)	0–14			15–49			50–59			60–64		
Year	M	F	P	M	F	P	M	F	P	M	F	P
1963 ..	—	—	—	0·03	0·04	0·03	0·33	0·22	0·27	1·29	0·57	0·90
1964 ..	—	—	—	0·03	—	0·01	0·23	0·22	0·23	1·30	1·13	1·21
1965 ..	—	—	—	0·03	—	0·01	0·46	0·23	0·35	1·2	0·69	0·85
1966 ..	—	0·02	0·01	0·05	0·02	0·04	0·27	0·13	0·19	1·58	1·17	1·36
1967 ..	0·02	—	0·01	0·04	0·01	0·02	0·14	0·19	0·16	0·39	0·20	0·29
1968 ..	—	—	—	0·02	0·01	0·01	0·17	0·13	0·15	0·34	1·01	0·79

Retinitis pigmentosa and allied conditions including macular dystrophy

Age group (years)	0–14			15–49			50–59			60–64		
Year	M	F	P	M	F	P	M	F	P	M	F	P
1963 ..	0·04	0·02	0·03	0·63	0·33	0·48	1·10	0·66	0·57	1·55	0·79	1·13
1964 ..	0·07	0·03	0·05	0·37	0·50	0·43	0·93	0·47	0·69	1·54	0·85	1·17
1965 ..	0·09	0·02	0·06	0·46	0·36	0·41	0·86	0·71	0·79	1·20	0·90	1·04
1966 ..	0·05	0·09	0·07	0·45	0·39	0·42	0·87	0·94	0·90	1·18	0·75	0·95
1967 ..	0·04	0·02	0·03	0·42	0·32	0·37	0·61	0·51	0·56	1·01	0·68	0·83
1968 ..	0·10	0·11	0·11	0·55	0·37	0·46	1·05	0·72	0·88	1·55	1·15	1·33

Iritis and iridocyclitis

Age group (years)	0–14			15–49			50–59			60–64		
Year	M	F	P	M	F	P	M	F	P	M	F	P
1963 ..	0·04	0·40	0·04	0·10	0·08	0·09	0·27	0·53	0·37	0·34	0·79	0·59
1964 ..	0·04	0·05	0·04	0·11	0·11	0·11	0·40	0·62	0·51	0·24	0·71	0·49
1965 ..	0·04	—	0·02	0·13	0·11	0·12	0·17	0·65	0·42	0·32	0·69	0·52
1966 ..	—	0·06	0·03	0·14	0·16	0·15	0·37	0·38	0·37	0·95	0·96	0·95
1967 ..	0·04	0·02	0·03	0·12	0·06	0·09	0·41	0·10	0·25	0·55	0·48	0·51
1968 ..	—	—	—	0·09	0·08	0·09	0·38	0·55	0·47	0·46	1·08	0·79

M = Males F = Females P = Persons

TABLE 13—continued

Optic atrophy presumed or known as acquired

Age group (years)	0–14			15–49			50–59			60–64		
Year	M	F	P	M	F	P	M	F	P	M	F	P
1963 ..	0·16	0·25	0·21	0·47	0·34	0·41	0·66	0·34	0·47	0·77	0·50	0·63
1964 ..	0·02	0·13	0·08	0·50	0·50	0·50	0·93	0·59	0·76	0·73	0·71	0·72
1965 ..	0·14	0·28	0·21	0·55	0·35	0·45	0·86	0·62	0·74	1·20	0·83	1·00
1966 ..	0·23	0·26	0·24	0·49	0·44	0·46	0·57	0·78	0·68	0·87	0·69	0·77
1967 ..	0·35	0·33	0·34	0·70	0·37	0·54	0·98	0·67	0·82	1·48	0·75	1·09
1968 ..	0·40	0·28	0·34	0·54	0·53	0·53	0·91	0·65	0·77	1·32	0·61	0·64

Congenital defects

Age group (years)	0–14			15–49			50–59			60–64		
Year	M	F	P	M	F	P	M	F	P	M	F	P
1963 ..	0·42	0·52	0·47	0·16	0·18	0·17	0·13	0·16	0·15	—	0·14	0·08
1964 ..	0·64	0·46	0·54	0·12	0·11	0·11	0·17	6·22	0·19	0·33	0·21	0·26
1965 ..	0·50	0·36	0·43	0·20	0·17	0·19	0·13	0·16	0·14	0·24	0·14	0·19
1966 ..	0·65	0·62	0·64	0·13	0·12	0·13	0·17	0·16	0·16	0·18	0·21	0·15
1967 ..	0·49	0·39	0·44	0·12	0·14	0·13	0·20	0·10	0·15	0·47	0·20	0·33
1968 ..	0·40	0·53	0·46	0·26	0·18	0·19	0·25	0·10	0·17	0·31	0·20	0·25

Retinal aplasia and allied conditions

Age group (years)	0–14			15–49			50–59			60–64		
Year	M	F	P	M	F	P	M	F	P	M	F	P
1963 ..	0·18	0·15	0·17	0·01	—	0·01	—	—	—	—	—	—
1964 ..	0·15	0·13	0·14	0·02	0·01	0·01	0·03	—	0·02	—	—	—
1965 ..	0·22	0·15	0·18	0·07	0·04	0·05	—	—	—	—	—	—
1966 ..	0·14	0·24	0·19	0·01	0·03	0·02	0·03	—	0·02	—	—	—
1967 ..	0·07	0·06	0·06	—	—	—	—	—	—	—	—	—
1968 ..	0·05	0·13	0·09	0·01	—	0·01	—	—	—	—	0·07	0·04

M = Males F = Females P = Persons

TABLE 14

Comparison of age distribution by sex of those blinded by the same cause and by a different cause in the two eyes: 1963–68

	Blindness from the same cause in both eyes			Blindness from a different cause in the two eyes		
	Males	Females	Persons	Males	Females	Persons
Number for which age and sex are known	6,527	6,715	13,242	307	169	476
Age group (years)	Percentage Distribution					
0–29	21·8	16·2	18·9	6·8	4·1	5·8
30–49	24·5	17·9	21·2	18·6	8·9	15·1
50–59	27·0	31·7	29·4	31·9	32·6	32·1
60–64	26·7	34·2	30·5	42·7	54·4	47·0
	100·0	100·0	100·0	100·0	100·0	100·0

TABLE 15

Blindness from a different cause in two eyes: 1963–68 (each eye listed separately)

(*a*) *Total number recorded*

Male	Female	Persons
614	338	952

(*b*) *Incidence of specifically unilateral causes of blindness*

	Males		Females		Persons	
	Number	%	Number	%	Number	%
Trauma	202	32·9	56	16·5	258	27·1
Ocular tumours	2	0·3	8	2·4	10	1·1
Amblyopia ex anopsia	28	4·6	24	7·1	52	5·5

TABLE 16

Percentage distribution by sex of the different varieties of trauma as a cause of unilateral blindness: 1963–68 (each eye listed separately)

	Males	Females	Persons
Number of eyes blinded by trauma	614	338	952
	Percentage of all Causes		
Occupational activities	8·9	1·1	6·2
Household activities	0·5	0·6	0·5
Play or sport	6·2	2·4	4·8
Traffic or travel	2·1	1·5	1·9
Military operations	2·3	0·3	1·6
Sympathetic ophthalmia	3·1	2·4	2·8
Other activities not specified or inadequately specified..	9·8	8·3	9·3
All other causes	67·1	83·4	72·9
	100·0	100·0	100·0

TABLE 17

Sympathetic ophthalmia: 1963–68 (exciting causes)

	1963		1964		1965		1966		1967		1968		1963–68		
	M	F	M	F	M	F	M	F	M	F	M	F	Males	Females	Persons
Following operations ..	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Trauma:															
Occupational ..	1	—	—	—	1	—	—	—	—	—	2	—	4	—	4
Household ..	—	—	—	—	1	—	—	—	—	—	—	—	1	—	1
Play or sport ..	3	—	3	—	—	1	—	—	1	—	1	—	8	1	9
Traffic or travel	1	—	—	—	—	—	—	1	—	—	—	—	—	1	2
Military ..	—	—	—	—	—	—	—	—	—	—	—	—	—		—
Not specified ..	1	1	2	2	—	2	1	1	1	—	—	—	5	6	11
	6	1	5	2	2	3	1	2	2	—	3	—	19	8	27

trauma. The lack of cases following surgery is mainly due to the relatively few cases of cataract and glaucoma in the present material with its limitation to those under the age of 65.

5 Data from Sunshine Homes for Blind Babies

Table 18 sets out the diagnosis in 224 infants under 5 years of age admitted to the Sunshine Homes during 1963–1968. Several points are noteworthy:

(1) Neither ophthalmia neonatorum nor trauma figure as a cause of blindness.
(2) Infections are represented by 9 cases (or 6 if 'pseudoglioma' is questioned).
(3) Among the congenital affections—and they contributed 114 cases out of the total of 224—cataract leads with 33 cases, followed by 'retinal lesions' with 16 cases and retinoblastoma with 9.
(4) The two outstanding causes were optic atrophy (68 cases) and retrolental fibroplasia (21 cases).

DISCUSSION

1 The Incidence of Blindness

The new registrations

Numbers

It may be seen from Table 1 that the annual number of new registrations was around 11,500 in 1963 and around 13,000 for each of the successive five years. This is substantially more than the average of around 11,000 in the nineteen-fifties, and is largely due to an increase in the number of elderly women seeking registration. The steady and substantial increase in the number of women aged 70 and over registered in each of the years since 1948 is brought out in Table 19, in which the data in Table 2 are summarized and set against the corresponding data for the years 1949–62.

Overall rates

Table 20 gives the rates per 100,000 by age and sex for the years 1963–68 set against the data previously recorded for 1955–62. Several considerations arise.

For males the rates have remained fairly stationary at around 20 per 100,000 during the whole period of 1955–68. For females the rates have been fairly stationary at around 33 to 34 per 100,000 during 1964–68, and these rates have shown some increase over those for 1955–63.

Sex differences

The increase in the overall rate for females since 1963 is the product of two opposing tendencies—a decline in incidence at ages up to 50 and an increase in rates at higher ages. These latter increases were particularly evident at all ages above 60 in 1964, after which year the rates declined again, except for the most

TABLE 18

Causes of blindness in children admitted to Sunshine Homes for Blind Babies 1963–68

Cause	1963	1964	1965	1966	1967	1968	1963–1968	
Infections:								
Endophthalmitis	—	—	—	1	2	—	3	
Pseudoglioma	1	1	1	—	—	—	3	
Toxoplasmosis	—	—	—	—	1	—	1	9
Meningitis	—	—	—	—	—	2	2	
Trauma:	—	—	—	—	—	—	—	—
Congenital:								
"Congenital anomalies"	1*	—	1	3	4	1	10	
Nystagmus	1	—	1	—	—	—	2	
Microphthalmos	4	1	6	2	1	4	18	
Anophthalmos	—	1	—	1	1	3	6	
Buphthalmos	3	2	1	1	—	1	8	
Optic atrophy ("Congenital")	—	—	—	—	—	—	—	
Cataract	10	5	5	8	2	3	33	
Retinoblastoma	1	3	3	1	—	1	9	114
Aniridia	2	1	1	—	—	—	4	
Coloboma	—	—	1	—	1	—	2	
Retinal lesions	—	7	2	2	3	2	16	
Corneal lesions	—	—	—	—	1	—	1	
Cortical blindness	—	—	—	—	—	2	2	
Other presumed congenital affections	—	—	1†	—	2‡	—	3	
Other affections:								
Optic atrophy due to injury or tumour	—	—	1	2	1	—	4	
Optic atrophy not further defined	10	11	12	6	12	13	64	
Retrolental fibroplasia	3	2	3	4	3	6	21	
Presumed rubella	—	—	—	2	3	2	7	101
"Corneal ulcer", "keratitis" and "corneal scarring"	2	—	—	—	2	1	5	
All causes	38	34	39	33	39	41		224

*Cryptophthalmos

†"Idiopathic"

‡One "atrophy"; one "maldevelopment of cortex"

TABLE 19

New registrations by major age groups: 1948–68

Age group (years)	0–15			16–49			50–59			60–69			70 and over			All known ages		
Year	M	F	P	M	F	P	M	F	P	M	F	P	M	F	P	M	F	P
1948 ..	167	127	294	518	420	938	1,070(a)	1,428(a)	2,498(a)				1,907	2,966	4,873	3,662	4,941	8,603
1949 ..	161	143	304	563	454	1,017	388	459	847	788	1,165	1,953	2,412	4,108	6,520	4,312	6,239	10,641
1950 ..	181	161	342	483	368	851	418	468	886	780	1,147	1,927	2,741	4,397	7,138	4,603	6,541	11,144
1951 ..	217	183	400	470	385	855	394	505	899	823	1,178	2,001	2,633	4,662	7,295	4,537	6,913	11,450
1952 ..	180	155	335	437	341	778	395	444	839	821	1,173	1,994	2,668	4,527	7,185	4,501	6,640	11,141
1953 ..	202	140	342	426	369	795	372	466	838	772	1,245	2,017	2,774	4,780	7,554	4,546	7,000	11,546
1954 ..	197	146	343	400	346	746	360	462	822	727	1,243	1,970	3,047	5,563	8,610	4,731	7,760	12,491
1955 ..	176	115	291	394	288	682	329	427	756	654	1,116	1,770	2,908	5,230	8,138	4,461	7,176	11,637
1956 ..	170	102	272	394	313	707	348	400	748	698	1,175	1,873	2,989	5,470	8,459	4,559	7,640	12,059
1957 ..	137	93	230	342	263	604	344	400	744	693	1,014	1,707	2,764	5,225	7,989	4,280	6,995	11,275
1958 ..	148	104	252	356	239	595	316	373	689	637	1,064	1,701	2,551	4,990	7,541	4,008	6,770	10,778
1959 ..	131	98	229	413	242	655	329	375	704	732	997	1,729	2,789	5,472	8,261	4,394	7,184	11,578
1960 ..	137	78	215	344	239	583	331	445	776	680	1,086	1,766	2,838	5,490	8,328	4,330	7,338	11,668
1961 ..	118	86	204	331	246	577	294	371	665	631	960	1,591	2,535	5,245	7,780	3,909	6,908	10,817
1962 ..	114	106	220	347	259	606	301	350	651	700	970	1,670	2,858	5,497	8,355	4,320	7,182	11,502
1963 ..	140	121	261	382	262	644	337	378	715	698	1,041	1,739	2,704	5,511	8,215	4,261	7,313	11,574
1964 ..	131	133	264	372	296	668	333	391	724	780	1,139	1,919	3,119	6,389	9,408	4,735	8,348	13,083
1965 ..	160	107	267	386	270	656	343	392	735	810	1,098	1,908	2,947	6,299	9,246	4,646	8,166	12,812
1966 ..	165	132	297	365	283	648	340	427	767	741	1,121	1,862	3,206	6,562	9,768	4,817	8,525	13,342
1967 ..	140	124	264	426	270	696	316	386	702	769	1,122	1,891	3,103	6,324	9,427	4,754	8,226	12,980
1968 ..	142	125	267	409	285	694	338	381	719	802	1,101	1,903	2,983	6,390	9,373	4,674	8,282	12,956

M = Males F = Females P = Persons

(a) 50–69 years

TABLE 20

New registrations: 1955–68

Rates per 100,000 of the home population in some age groups

Age Group (years)	Under 1	1–4	5–15	16–20	21–29	30–39	40–49	50–59	60–64	65–69	70–79	80–84	85 and over	All ages
Year	MALES													
1955	6·9	6·1	1·9	2·0	2·5	3·9	5·5	12·4	25·8	51·6		233·0(a)		20·9
1956	6·6	6·0	1·8	2·5	2·3	3·6	5·9	12·8	28·7	52·9		238·2(a)		21·4
1957	4·5	4·4	1·6	1·5	1·8	3·9	4·8	12·3	27·5	52·8	135·3	429·9	672·1	19·8
1958	5·7	3·1	2·2	2·2	1·5	3·6	5·6	11·1	27·7	44·9	131·6	390·3	552·3	18·4
1959	5·8	4·0	1·4	3·0	2·4	3·8	6·3	11·3	30·5	51·9	142·6	431·0	590·0	20·1
1960	3·4	4·2	1·6	1·9	1·9	3·5	5·1	11·2	23·4	53·0	140·1	417·9	642·6	19·7
1961	4·0	3·5	1·3	2·0	1·8	3·0	5·2	9·9	19·5	50·6	121·9	378·0	601·1	17·5
1962	2·9	3·3	1·3	1·9	2·0	3·5	5·0	10·1	23·1	52·5	146·0	402·5	624·5	19·1
1963	3·8	4·2	1·5	2·0	2·3	3·8	5·4	11·2	25·4	47·28	139·07	365·76	621·4	18·6
1964	3·7	3·4	1·5	2·1	1·9	3·4	5·7	11·1	28·6	50·2	149·7	438·9	741·5	20·6
1965	4·6	4·5	1·7	2·5	2·0	3·9	5·3	11·4	27·3	52·8	138·7	385·6	755·1	20·0
1966	4·6	4·6	1·7	2·6	2·0	3·6	4·9	11·4	24·3	47·5	152·1	411·5	840·6	20·7
1967	3·5	3·8	1·5	2·0	2·5	4·0	6·4	10·7	24·1	48·3	146·1	399·2	772·6	20·3
1968	3·9	4·1	1·4	2·5	2·6	3·3	5·9	11·8	24·3	49·2	139·7	403·7	711·2	19·8
Year	FEMALES													
1955	3·5	4·4	1·3	0·9	1·6	2·0	5·0	14·3	33·6	64·2		262·4(a)		31·2
1956	3·3	3·6	1·2	1·4	1·6	2·5	5·2	13·2	33·2	69·0		268·8(a)		32·2
1957	2·7	3·4	1·1	1·9	1·1	2·2	4·2	13·1	27·6	59·5	162·1	422·7	656·0	30·1
1958	4·0	3·5	1·2	0·7	1·1	2·0	4·3	12·0	30·5	59·6	150·7	390·2	636·2	29·0
1959	2·5	3·2	1·3	1·2	0·9	2·4	3·9	12·0	30·3	52·6	161·6	404·5	713·5	30·6
1960	3·1	2·9	0·8	1·3	1·6	2·0	3·8	14·1	28·8	60·8	155·1	410·4	678·3	31·0
1961	1·6	3·4	0·9	0·9	1·2	2·1	4·2	11·7	26·3	52·0	141·3	377·9	659·9	29·0
1962	2·5	3·4	1·3	1·2	1·1	2·1	4·6	11·0	26·9	51·0	149·5	388·9	647·6	28·7
1963	3·5	3·3	1·5	1·2	1·2	2·4	4·4	11·8	27·8	54·9	147·7	386·9	640·2	30·2
1964	4·9	4·2	1·3	1·2	1·7	2·4	5·0	12·2	30·9	68·1	161·7	432·5	762·4	34·3
1965	2·2	2·4	1·6	1·4	1·5	2·3	4·4	12·2	31·1	53·0	154·0	416·2	739·7	3333
1966	2·4	4·1	1·5	1·3	1·5	2·7	4·4	13·3	28·7	56·6	162·4	422·9	737·5	34·6
1967	3·2	3·7	1·4	1·0	1·6	2·0	4·7	12·2	28·1	56·2	150·7	388·3	702·8	33·2
1968	4·8	3·4	1·3	1·2	1·7	2·1	4·9	12·4	28·6	52·8	144·0	382·3	745·5	33·2

(a) All ages over 70

advanced ages, 85 and over, where the higher level has been maintained. It is still an open question whether in women these vagaries represent belated registration and other social considerations or whether there is in fact a sex difference in the incidence of blindness, and, if so, whether a lower initial incidence is reversed with age.

Age differences

For the years 1963–1968, excluding the age group 0–4 years for boys and 0–15 for girls, the rates per 100,000 rose steadily with increasing age. This conforms to the findings in previous years that the incidence of blind registration rises with increasing age and does so quite sharply after middle life.

As for the fluctuations in the rates for the individual age groups, these showed no consistent pattern during 1963–1968. Set against the years 1955–1962 the changes are most evident at the two extremes of life.

(i) *At 85 years and over.* During 1957–62 the rate per 100,000 was of the mean order of almost 600 for men and about 650 for women. In 1963–1968 these rates had risen by about 100 for men and rather less for women. This may merely reflect the increase in the new registrations of those over 90 in this age group (Table 1).

(ii) *At 0–15 years. At 0–1 year* the highest rate was seen in 1951 when it was 11·9 per 100,000. It had declined sharply to 2·9 per 100,000 for boys and 2·5 for girls by 1962 (Sorsby, 1966). The rates during 1963–68 were, however, consistently higher for boys and almost as consistently so for girls. *At 1–4 years* the highest rates were recorded in 1954; they were 6·2 for boys and 5·3 for girls; they had fallen to 3·3 and 3·4 respectively by 1962. Here again the rates were consistently—though not substantially—higher for boys during 1963–68 and almost as consistently so for girls. *At 5–15 years* the rate for boys was of the order of 1·6 during 1955–62 and about 1·1 for girls. The rates for boys during 1963–68 were largely of the same order, but those for girls were consistently higher, ranging from 1·3 to 1·6 per 100,000.

It may be more helpful to consider all ages under 16 as one group than to deal with them, as above, in three separate groups. Under the age of 5 registration is likely to be erratic as the need for schooling is not pressing; at 5–15 years a blind child is not likely to miss registration. Taking registrations at 0–15 as one group, it will be seen from Table 21 that the rates per 100,000 are consistently higher for the years 1963–68 than in the immediately preceding years. There is clearly no decline in the total incidence of blindness in childhood, though blindness from retrolental fibroplasia has declined very sharply. That there has been no decline is further emphasized by the data in Appendix Table I.F which gives the available data on the incidence for partial sight in children during 1957–68.

The persistently high incidence of infantile blindness is also seen from Table 22, which gives the number of new registrations at 0–1 and at 1–4 years during 1963–68 after excluding the cases known to be due to retrolental fibroplasia. These data are set against the corresponding data for 1951–62. There has clearly been no reduction in the rates per 100,000 at 0–4 years for boys or girls, and, as the trend to-day is not to press for registration as blind in the case of infants, these rates may well conceal a rising incidence of blindness in infants—a reading further supported by the rising rates in new registrations as partially sighted at 0–4 years for 1963–68 (Appendix Table I.F).

TABLE 21

New registrations at 0–15 years: 1948–68
Rates per 100,000

	Number			Rate per 100,000		
Year	M	F	P	M	F	P
1948	167	127	294	3·3	2·6	3·0
1949	161	143	304	3·1	2·9	3·0
1950	181	161	342	3·5	3·2	3·4
1951	217	183	400	4·1	3·6	3·9
1952	180	155	355	3·4	3·1	3·2
1953	202	140	342	3·8	2·7	3·3
1954	197	146	343	3·7	2·8	3·3
1955	176	115	291	3·3	2·2	2·6
1956	170	102	272	3·1	2·0	2·5
1957	137	93	230	2·5	1·8	2·1
1958	148	104	252	2·6	1·9	2·3
1959	131	98	229	2·3	1·8	2·1
1960	137	78	215	2·4	1·4	1·9
1961	118	86	204	2·2	1·7	1·9
1962	114	106	220	2·1	2·1	2·1
1963	140	121	261	2·6	2·3	2·4
1964	131	133	264	2·4	2·1	2·2
1965	160	107	267	2·9	2·0	2·4
1966	165	132	297	2·9	2·4	2·7
1967	140	124	264	2·4	2·3	2·4
1968	142	125	267	2·4	2·3	2·4

M=Males F=Females P=Persons

TABLE 22

New registrations at 0–4 years: 1951–68
(excluding the cases known to be due to retrolental fibroplasia)

	Number				Rate per 100,000		
Age group (years)	Under 1		1–4		0–4		
Year	M	F	M	F	M	F	P
1951	23	20	79	67	5·34	4·78	5·06
1952*	9	19	54	47	3·51	3·85	3·68
1953	16	11	65	56	4·67	4·05	4·37
1954	21	10	75	55	5·63	4·00	4·84
1955	16	8	70	37	5·11	2·81	3·99
1956	12	9	64	34	4·50	2·68	3·61
1957	13	6	56	38	4·04	2·71	3·39
1958	19	13	42	40	3·51	3·21	3·36
1959	17	6	55	39	4·06	2·67	3·38
1960	13	10	58	34	3·90	2·54	3·24
1961	14	5	49	47	3·36	2·92	3·15
1962	12	9	48	44	3·09	2·88	2·98
1963	15	13	65	47	4·00	3·16	3·59
1964	14	19	55	62	3·35	4·15	3·74
1965	17	6	74	39	4·31	2·25	3·31
1966	16	10	76	63	4·30	3·60	3·96
1967	12	11	64	57	3·55	3·34	3·45
1968	13	18	65	53	3·66	3·51	3·59

*Computed on the returns for the 9 months April–December, 1952
M=Males F=Females P=Persons

The blind population

The total number of persons on the blind register rose steadily from 96,729 in 1962 to 102,730 in 1968—an increase of 6,001. This is slight, when it is remembered that the number of new registrations over these 6 years was 76,808. It is clear that the influx of new registrations is almost balanced by deaths amongst the registered blind, for only exceptionally is a name removed for reasons other than decease.

A high mortality among the registered blind is of course to be expected in view of the age structure of the blind population. The annual mortality would seem to be of the order of 10 per cent.

Sex differences

The difficulties concerning the total number on the register are brought out by Table 23, which shows that the rate per 100,000 males appears to have been rising between 1948 and 1956 and declining sharply since; for females there is an almost uninterrupted rise over the years 1948–68, most marked in the earlier years. The declining rate in men may well represent a true fall in the incidence of blindness in males. The rising rate for females may merely indicate an increasing proportion of elderly women who came to registration. It is, however, clear from Table 24 that in the highest ages on the Blind Register there is a substantial increase in actual numbers in both men and women, most marked in the latter.

The blind of school age (5–15 years)

As the school authorities are responsible for the provision of education for blind children, registration as blind is virtually compulsory for children of school age and the statistical returns are thus fuller than for the other ages. The rates for 1963–68 are now falling for both boys and girls; but, as can be seen from Table 25 which shows these rates set against those for 1948–62, there is still some residual effect of the influx of retrolental fibroplasia in the early fifties. Some further decline in the number and rates now recorded may be expected, but the data on new registrations leave little hope that rates substantially lower than those recorded for 1948–50 will be achieved in the foreseeable future. There is clearly no prospect of achieving the decline by almost half which occurred between 1923 and 1943, the years which saw the virtual elimination of the infective causes of blindness (Sorsby, 1950).

Limitations of the statistics on blindness

Overall incidence

In an earlier study (Sorsby, 1966) it was suggested that, as 61·4 per cent of those registered during 1957–60 had been referred by various lay authorities and only 38·6 per cent by medical sources, there must be many eligible blind who do not become registered. The data were not complete, for information was available on only 32,509 of the total of 45,361 registered during those four years. In the present study, the data were also incomplete on 10,289 of the total of 13,728 (Table 26), and the proportions referred by medical and by lay authorities had become reversed (59·1 and 40·9 per cent respectively). The change is probably largely due to the fact that the first sample covered registrations at all ages and the second only those aged 0–64 years; and that reference by lay sources is distinctly higher at the higher ages. In any case it is clear that medical sources miss a substantial number of people who are eligible for registration. It is

TABLE 23

The registered blind: 1948–68. Rates per 100,000 by sex

Year	Number on register			Home population in thousands			Rate per 100,000		
	M	F	P	M	F	P	M	F	P
1948(*)	36,464	42,115	78,579	20,888	22,408	43,296	174·6	187·9	181·5
1949(*)	37,242	44,078	81,320	21,050	22,545	43,595	176·9	195·5	186·5
1950(*)	37,942	45,522	83,464	21,169	22,661	43,830	179·2	200·9	190·4
1951(*)	38,783	47,606	86,389	21,044	22,771	43,815	184·3	209·1	197·2
1952	39,509	49,087	88,596	21,110	22,845	43,955	187·2	214·9	201·6
1953	39,984	50,622	90,606	21,206	22,903	44,109	188·6	221·0	205·4
1954	40,626	52,996	93,622	21,288	22,986	44,274	190·8	230·6	211·5
1955	40,498	53,985	94,683	21,389	23,052	44,441	190·3	234·2	213·1
1956	40,803	55,216	96,019	21,517	23,150	44,667	189·6	238·5	215·0
1957	40,633	56,133	96,766	21,648	23,259	44,907	187·7	241·3	215·5
1958	40,114	56,361	96,475	21,744	23,365	45,109	84·5	241·2	213·9
1959	40,063	56,886	96,949	21,885	23,501	45,386	183·1	242·1	213·6
1960	39,965	57,504	96,469	22,070	23,685	45,755	181·1	242·8	213·0
1961	39,228	57,363	96,591	22,353	23,852	46,205	175·5	240·5	209·0
1962	39,123	57,606	96,729	22,660	24,049	46,709	172·7	239·5	207·1
1963	38,776	57,696	96,472	22,834	24,194	47,028	170·0	238·5	205·1
1964	39,305	59,207	98,512	23,044	24,357	47,401	170·6	243·1	207·8
1965	39,507	60,300	99,807	23,227	24,536	47,763	170·1	245·8	209·0
1966	39,749	61,524	101,273	23,392	24,683	48,075	169·9	249·3	210·7
1967	39,982	62,615	102,597	23,562	24,829	48,391	169·7	252·2	212·0
1968	39,840	62,890	102,730	23,636	24,963	48,593	168·6	251·5	211·4

(*)Blind population as shown on March 31 of the following year
M=Males F=Females P=Persons

TABLE 24

The age structure by sex of the blind population in 1957, 1962, 1963 and 1968

Age Group (years)	1957			1962			1963			1968		
	M	F	P	M	F	P	M	F	P	M	F	P
0–15	1,317	982	2,299	1,265	988	2,253	1,239	996	2,235	1,189	944	2,133
16–49	7,852	5,790	13,642	7,203	5,203	12,406	7,117	5,065	12,182	7,039	5,001	12,040
50–59	5,325	5,095	10,420	5,166	4,784	9,950	5,143	4,763	9,906	4,826	4,356	9,182
60–69	7,589	9,431	17,020	7,232	9,044	16,276	7,169	8,933	16,102	7,416	9,207	16,623
70–79	10,002	16,527	26,529	9,257	16,240	25,497	9,243	16,293	25,536	9,612	16,945	26,557
80–89	7,647	15,301	22,948	7,835	17,443	25,278	7,640	17,515	25,155	8,087	20,607	28,694
90 and over	887	2,990	3,877	1,159	3,872	5,031	1,214	4,119	5,333	1,663	5,801	7,464
All known ages	40,619	56,116	96,735	39,117	57,574	96,691	38,765	57,684	96,449	39,832	62,861	102,693

M=Males F=Females P=Persons

TABLE 25

The registered blind under 16 years: 1948–68

Year	AGE GROUP (years)									
	Under 1		1–4		5–15					
	Number		Number		Number			Rate per 100,000		
	M	F	M	F	M	F	P	M	F	P
1948	8	8	149	136	795	574	1,369	25·1	18·8	22·0
1949	17	11	168	160	789	575	1,364	24·5	18·5	21·5
1950	12	15	209	198	800	596	1,396	24·3	18·8	21·6
1951	20	20	267	220	803	639	1,442	24·0	19·9	22·0
1952	9	17	275	240	844	659	1,503	24·1	19·6	21·9
1953	16	5	298	268	873	666	1,539	24·2	19·3	21·8
1954	9	8	326	267	907	705	1,612	24·7	20·0	22·4
1955	10	3	307	252	955	725	1,680	25·6	20·3	23·0
1956	13	16	274	197	1,021	790	1,811	27·0	21·8	24·5
1957	5	1	252	163	1,060	818	1,878	27·6	22·3	25·0
1958	8	6	208	146	1,108	829	1,937	28·6	22·4	25·6
1959	9	—	202	128	1,098	856	1,954	28·2	23·1	25·7
1960	4	6	191	121	1,102	848	1,950	28·4	22·9	25·7
1961	5	2	174	120	1,099	846	1,945	28·1	22·7	25·5
1962	6	1	168	122	1,091	865	1,956	27·8	23·2	25·5
1963	4	7	178	125	1,057	864	1,921	27·4	23·5	25·2
1964	4	9	176	153	1,062	840	1,902	27·7	23·0	25·2
1965	10	5	183	157	1,075	804	1,879	28·0	22·0	25·1
1966	10	2	211	163	1,024	820	1,844	26·5	22·3	24·4
1967	5	7	214	167	987	791	1,778	25·1	21·1	23·1
1968	6	6	214	160	969	778	1,747	24·0	20·3	22·2

M=Males F=Females P=Persons

TABLE 26

Source of reference in 10,289 of the blind aged 0–64 years registered during 1963–68

Source	AGE GROUP (years)													
	0–4		5–14		15–29		30–49		50–59		60–64		All known ages	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Medical ..	440	73·2	314	74·8	463	60·8	1,267	58·2	1,792	57·9	1,805	56·1	6,081	59·1
Lay	160	26·8	106	25·2	298	39·2	911	41·8	1,304	42·1	1,429	43·9	4,208	40·9

impossible to assess how substantial that number is, for those who are now referred for registration by lay authorities may or may not be the bulk of those eligible for registration.

The most marked increase in the number of registered blind occurred in the early years of the working of the Blind Persons Act of 1920. Between 1919 (when the register was prepared from the records of the charitable blind societies) and 1929 the numbers rose from 25,840 to 52,727. By 1938 the number had risen to 71,875 and by 1948 to 78,579. For the years 1956–63 the number was fairly stationary at around 96,000, but between 1948 and 1955 it had risen steeply from 78,579 to 94,683 and this was followed by a slower increase between 1963 and 1968. The doubling of the number of registered blind between 1919 and 1929 was clearly the consequence of administrative changes resulting from the Blind Persons Act of 1920. The increase by another 20,000 between 1929–38 was probably also largely administrative in character.

The change in the age structure of the general population since 1921 has of course contributed substantially to the number of blind. In the 1921 census the population of 65 and over constituted only 6·0 per cent of the total; it rose to 7·4 per cent in 1931 and to 11·0 per cent in 1951. In recent years the increase in this age group has been slight, being only 11·9 per cent in the 1961 census and 12·4 per cent in 1966. The vagaries in the increase in the number of new registrations recorded since 1948 and the puzzlingly stable figures between 1956 and 1963 suggest that other factors beside increase in the total population and in the proportion of elderly come into play. In all probability there is a substantial unregistered and unrecognized moiety of blind, and fluctuations in the annual registrations might well reflect ill-understood movements within that population.

The incidence of blindness in childhood

It has already been stressed that the decline in the rates per 100,000 in children aged 5–15 was unequivocal only for the years 1923–42; that the subsequent years (Table 25) showed a less encouraging pattern, and that there is no likelihood of any further decline in the foreseeable future since childhood blindness is now the result of irremediable congenital and hereditary disorders. Things may actually get worse, for recent years have seen the emergence of new causes of infantile blindness of which retrolental fibroplasia is only an extreme example.

Infantile blindness: new problems. The better management of premature infants and of infants requiring special care is keeping alive a group of babies who show a substantial incidence of multiple defects of which blindness is only one. There is some evidence that some forms of congenital optic atrophy, with or without additional defects, are aspects of marked prematurity or immaturity. The recognition of maternal rubella as a blinding affection has of course not increased its incidence, but affected infants may now well have a better chance of survival. Minor epidemics of rubella do not appear to be reflected in the blind statistics.

Iatrogenic disease is a largely unexplored field in relation to congenital blindness. It is clear that the broad concept of congenital disease covers many different problems among which genetically determined disorders are merely the best recognized. Spontaneous and induced embryopathies together with better management of infants affected by congenital disease appear likely to contribute to a stationary (and, possibly, increasing) incidence of blindness in infants.

These considerations have a bearing on the validity of the current statistics on blindness in childhood. With blind children often now also affected with multiple disorders, it is not unlikely that some who qualify for registration as blind may be overlooked. How frequently this occurs is not known, but it is clear that the concept of blindness in childhood is now much broader than it was when ophthalmia neonatorum and other purely ocular infections were the dominant causes. To-day blindness in childhood is increasingly part of various syndromes.

2 The causes of blindness

The distribution of the causes of blindness has been considered in Table 8 and in Appendix Table I.C. The pattern is relatively simple, being largely determined by age. In childhood the congenital defects predominate: these stand at 70·0 per cent at 0–4 years and 54·1 per cent at 5–14 years, declining to 25·3 per cent at 15–29 years. In higher age groups—at 30–64 years—diabetic retinopathy contributes from 15·4 to 20·8 per cent, and myopic chorioretinal atrophy from 11·5 to 17·1 per cent. Other causes have relatively little weight, except retinitis pigmentosa (16·7 per cent at 15–29 years) and glaucoma (12·9 per cent at 60–64 years). But in addition there is one cause—optic atrophy—that is operative substantially at all ages, and calls for fuller consideration. Further consideration needs also to be given to diabetic retinopathy, to monocular blindness and to trauma.

The optic atrophy complex

Optic atrophy is not a diagnosis but the end stage of many different affections of ocular, intracranial or systemic origin. It may be congenital, hereditary, traumatic and even iatrogenic in origin. The optic atrophy in glaucoma is traditionally not discussed as an affection of the optic nerve, and in blind statistics this type of optic atrophy and also the atrophy seen in syndromes do not always figure in returns as optic nerve disorders. Data for the frequency of optic atrophy as recorded in Table 7 therefore tend to underestimate its incidence. Even so optic atrophy, known or presumed to be of acquired origin, contributed 12·6 per cent of all cases and that of congenital origin a further 2·7 per cent; if glaucoma with its 7·2 per cent of all cases is included, optic atrophy, in this series of 13,242 patients under the age of 65 blinded by the same cause in the two eyes, is responsible for 22·5 per cent. Table 27 (in which glaucoma is excluded) is based on Appendix Table I.A and brings out the major aetiological groups. It will be seen that the largest number of cases are of undetermined origin, followed closely by specified affections as one group (discussed more fully below) and by intracranial tumours; prenatal influences (responsible for congenital and congenitally determined affections) give somewhat fewer cases. Multiple sclerosis is the smallest, though still a substantial, cause.

Each age group has its own features. At 0–14 years, prenatal influences are responsible for 241 of the 444 cases. At 15–29, undetermined causes, intracranial tumours and a multitude of specified affections as one group, are fairly equal in weight. At 30–49, multiple sclerosis is the leading cause, with intracranial tumours and undetermined causes not far behind. At 50–64 undetermined causes and the multitude of specified affections as one group each contribute

almost equally about one-third (216 and 198 cases respectively) of the total of 651.

Table 28 sets out the aetiological entities met with in the cases classified as due to prenatal influences and to specified affections (other than intracranial tumours and multiple sclerosis). It will be seen that congenital optic atrophy is as often only one of multiple congenital defects as an apparently sporadic defect. In some 25 per cent of cases a genetic origin was confirmed, or could be reasonably assumed. As for other specified disorders, systemic vascular disease led, comprising more than one-third of all cases; neurological disorders (other than multiple sclerosis) occurred almost as frequently as all systemic infections taken together and were as significant as all trauma.

The high incidence of "undetermined cause" in cases of optic atrophy is as perturbing as the high incidence due to intracranial tumour. Obviously not all cases of optic atrophy due to intracranial tumour are preventable, for the location of the compressing mass may render operation impossible. This is, however, exceptional in the records of the certificates. The frequency of optic atrophy from intracranial tumour thus points to the need for better early diagnosis, just as the frequency of undetermined causes stresses the need for better diagnosis at all stages. As for the rest of optic atrophy, only the quota of cases due to systemic infections, trauma and poisoning is amenable to some control in the foreseeable future. Any substantial reduction in the incidence of optic atrophy in adults is thus likely to come only with better diagnostic facilities. In children a clearer appreciation of the nature of the congenital optic atrophies is needed, and this, too, is a question of diagnostic facilities in a largely unexplored field.

Diabetic retinopathy

It has already been seen from Tables 11 and 13 that there is no clear evidence of any substantial increase in diabetic retinopathy in recent years. The data for 1955–62 showed a male incidence of around 1·0 per 100,000 at 50–59 and a female incidence of around 2·3 in the same age group (Sorsby, 1966). The corresponding rates for 1963–68 are about 1·5 (on small numbers) for males and 2·6 for females. There are no comparable data for the age group 60–64 years, but it would seem that the sharp increase in diabetic retinopathy recorded for 1948–55 has come to an end.

Diabetic retinopathy is, however, an outstanding cause of blindness. At all ages it is responsible for 13·1 per cent of cases in men and 18·2 per cent in women. As can be seen from Appendix Table I.C, diabetic retinopathy is a more substantial cause for men than women at 15–49 years, giving a total of 40 cases at 15–29 and of 281 at 30–49 years in men against 22 and 149 respectively for women. At 50–59 and at 60–64 years the number of cases of retinopathy for men, and the actual percentage, are both rather less than at 30–49, but in women diabetic retinopathy rises so steeply in numbers at 50–59 and at 60–64 years that it comes to occupy the leading position at these ages with 22·8 per cent and 24·8 per cent of all causes respectively.

Monocular blindness

The group comprises mainly *amblyopia ex anopsia* and injury.

Amblyopia ex anopsia

As this form of amblyopia develops in childhood the number registered in any

TABLE 27

Optic atrophy by aetiology: 1963–68. Age groups up to 64 years

Cause	AGE GROUP (Years)														
	0–14			15–29			30–49			50–64			All ages		
	M	F	P	M	F	P	M	F	P	M	F	P	M	F	P
Intracranial tumours ..	26	43	69	43	28	71	77	73	150	59	66	125	205	210	415
Multiple sclerosis	2	—	2	21	26	47	114	76	190	36	37	73	173	139	312
Other specified affections* ..	46	40	86	41	26	67	67	46	113	127	71	198	281	183	464
Affections due to pre-natal influences* ..	144	97	241	36	12	48	21	17	38	21	18	39	222	144	366
Undetermined ..	24	22	46	55	19	74	79	61	140	132	84	216	290	186	476
All specified causes	242	202	444	196	111	307	358	273	631	375	276	651	1,171	862	2,033

*Detailed data in Table 28

M = Males F = Females P = Persons

TABLE 28

Optic atrophy: 1963–68

Prenatal influences and other specified affections in detail

Aetiology	Males		Females		Persons	
Prenatal influences:						
Congenital	78		51		129	
Congenital, part of a syndrome	76	222	59	144	135	366
Genetic, established or presumed	60		29		89	
Others	8		5		13	
Other specified affections:						
Infections:						
Acquired syphilis	24		4		28	
Tuberculosis	14	53	12	36	26	89
Meningococcal meningitis	9		19		28	
Other	6		1		7	
Trauma		51		16		67
Poisonings		10		5		15
Tumours:						
Adnexa	9		4		13	
Metastatic	11	20	12	18	23	38
Site undetermined	0		2		2	
General disease:						
Vascular	83		71		154	
Neurological (other than multiple sclerosis) ..	47	147	26	108	73	255
Other	17		11		28	
All other specified affections		281		183		464

year is a variable fraction of the number who had developed amblyopia over many years previously. As was seen in Table 15, the number recorded in 1963–68 was 52 in 13,718 new registrations. This is of the same order as the 268 recorded for 1955–60 in 62,126 new registrations (all ages). It would seem, therefore, that in a population of a 100,000, there would be about 400 who had lost the sight of an eye in childhood from squint and subsequently become blind from another cause affecting the remaining eye.

Injury

Unlike amblyopia the loss of the sight of one eye from injury is not confined to childhood. It is a cumulative process extending mainly over the active years of life and shows a considerable sex difference. The total number recorded for 1963–68 was 258; this is of the same order as 1,372 recorded for the 62,126 new registrations during 1955–60. An overall estimate as with amblyopia is not as valid, but it would seem that the total of people who had lost one eye from injury would be about 2,000 in a blind population of 100,000.

The postulate that the present blind population of around 100,000 contains 400 people who have lost the sight of an eye from amblyopia and a further 2,000 from an ocular injury would appear to be credible. A substantial difficulty would arise if these figures were to be extended to the general population. The incidence of amblyopia and of eye injuries would be of the order of about fifty times that seen in the blind population i.e. 200,000 suffering from amblyopia and 1,000,000 from injuries; unless one makes the unjustifiable assumption that one-eyed people are more prone to develop blindness in their good eye, these figures are not credible. They would give a rate of 4 per 1,000 for amblyopia in the general population, and this is larger than the incidence of squint which is generally regarded as 3 per 1,000 children (though it is possible that this rate is a considerable underestimate). As for injury, the computation implies that 2 per cent of the population have lost the sight of an eye from this cause; clinical experience does not bear this out.

It is likely that there is a systematic fault in the data on amblyopia and monocular injuries. Both diagnoses—but particularly the first—are based on patients' histories. Though credible at first sight, the incidence recorded for these major causes of monocular blindness must be regarded as a substantial overestimate.

Trauma

As in the previous study, trauma showed its highest proportionate incidence at 15–29 years, when it gave 39 cases out of the total of 1,038 at this age. The incidence of trauma at 30–39 years was 29 out of 1,011, and at 40–49 years 26 out of 1,792. As can be seen from Table 29, all but 11 of these cases were in men, giving in them an incidence of 5·4 per cent, 4·1 per cent and 2·4 per cent at 15–29 years, 30–39 years and 40–49 years respectively. Any distinction between occupational and other types of trauma was not feasible.

The burden of trauma is, of course, higher than these figures suggest, for, as already shown, trauma is a substantial cause of unilateral blindness. Moreover there is also the blindness produced by sympathetic ophthalmia; this, though now numerically not very substantial (27 cases in this series as shown in Table 17), is a particularly distressing affection not only by reason of the extreme severity of its course but also because it is entirely preventable.

TABLE 29

Trauma: 1963–68.

Incidence in the age groups in which it is most prevalent

Age group (years)	Total number of blind			Cases of trauma		
	M	F	P	M	F	P
15–29	630	408	1,038	34	5	39
30–39	629	382	1,011	26	3	29
40–49	968	824	1,792	23	3	26

M=Males F=Females P=Persons

3 Some outstanding issues

Blindness in childhood

In children of school age, the one substantial difficulty as regards accurate statistical data is the possibility that blind children with multiple defects may not come to be registered as blind—a possibility of increasing importance with the increasing incidence of children so afflicted. As for the causes of blindness in the children registered as blind, these are known to fall for the most part within the category of congenital anomalies. The diagnoses are largely topographical—such as cataract, microphthalmos, buphthalmos, optic atrophy, and chorioretinal lesions—and all these are recognized as occurring in both hereditary and non-hereditary varieties. In the BD8 certificates definite information as to a genetic or environmental origin in any particular case is not always available, but there is considerable evidence from other studies that affections of genetic origin predominate. Studies in blind schools should help considerably to clarify these matters and it is gratifying that in recent years two such studies have become available. More could be done in maintaining and preserving the records at blind schools, for they are potential material for a national register on hereditary blinding disease.

In infants and children under school age the difficulties are much more complex. Lacking the systematic supervision that the school medical service provides, blind infants and pre-school children do not always come to be recognized as such. Even when seen at ophthalmic centres they do not necessarily become registered as blind because the need for such registration is no longer so widely accepted as it was in the fairly recent past. It is now believed that only in exceptional circumstances is it best for a blind infant to be brought up at a Sunshine Home rather than by its parents. One consequence is a rather loose ophthalmic supervision of some of these infants, and this is the more likely when the infants have multiple affections. A further difficulty is the occasional hesitation of certifying ophthalmologists to register an infant as blind when there is some uncertainty about the degree of vision that may be present. Certification as partially sighted may be effected both to avoid unnecessary registration as blind and to ensure some supervision. All this adds to the uncertainty as to numbers and diagnoses. It has already been stressed that blindness in infants is now often part of a syndrome rather than an isolated ocular defect. If only for this reason the adequate assessment of the incidence and nature of the blindness seen in childhood to-day calls for certification, or other statutory documentation, from centres equipped for the assessment of multiple handicaps in children. Such centres would need not only the necessary clinical and laboratory services but also a supporting clinical genetics unit. Ultimately these centres would have also to maintain contact with such children as are eventually admitted to blind schools.

Apart from the complexities of affections of pre-natal and pre-natally determined disorders there are also the perinatal disorders to consider. The 'birth injuries' of an earlier age are indeed real, though not in the mechanistic terms previously expounded; they are now visualized in physiological terms, such as prolonged delivery and anoxia at birth. These disturbances with their distressingly widespread complications illustrate once more that blindness in childhood is now often an aspect of a generalized disorder.

Underlying all discussions on blindness in childhood is the perturbing fact that there has been no decline in childhood blindness for the past 25 years. This is probably a consequence of the advances in paediatrics over this period, for such advances have led to a steady increase in the number of survivors among babies formerly doomed by prematurity, immaturity, intra-uterine infections, embryopathies of varied origin, by perinatal disturbances, and by genetic anomalies. With so many complex issues, the reduced infantile mortality has inevitably brought unforeseen problems and challenges, and it is gratifying that, clinically, these challenges are being met by an increasing number of efficient units for the special care of babies.

Diagnostic problems

While the congenital diseases raise questions in diagnosis related to aetiology, two adult affections—chronic glaucoma and optic atrophy—raise the problem of early diagnosis. Both these affections are generally slowly progressive and occasionally amenable to treatment.

The considerable effort that has gone in recent years into mass screening on ocular tension to establish the existence of "pre-glaucoma" appears to be flagging. It would seem that more promising results will be obtained from early diagnosis of existing glaucoma as shown by slight field defects revealed by central field screening. Should this prove to be so, there will be the considerable administrative problem of ensuring such screening in the population at risk.

Optic atrophy is too often diagnosed at its final stages. Ophthalmoscopic examination will not reveal early tell-tale field defects, such as those that may lead to the diagnosis of potential optic atrophy from increased intracranial tension. In optic atrophy as in glaucoma, the ophthalmoscope is not an instrument for early diagnosis. Ready assessment of retinal function has become clinically feasible by the use of the easily operated field screeners now available; localizing electro-retinography may also become possible. These developments may well lead to a substantial reduction in blindness, for glaucoma and preventable optic atrophy account for about 15 per cent of all blindness during the active years of life.

Trauma

Blindness from trauma bristles with difficulties. The available data show it as a substantial cause in young and middle-aged men but give little indication as to the nature of the causative injuries. It is likely that a considerable part of this substantial incidence is preventable, but field studies are needed for any clear guidance to action.

Source of reference for registration

Normally registration as blind would be the last service an ophthalmologist would give to a patient who had lost his sight. The high proportion of patients who came to registration as blind through lay sources—40·9 per cent in the present series—is not unexpected in the light of the findings in the earlier studies. It is however perturbing, and calls into question the adequacy of the current methods of registration—the essential infrastructure of welfare for the blind. This is discussed more fully later on (pp. 39, 61 and 64).

Statistical aspects

Accurate data on the incidence of blindness in children would not greatly affect the total number of blind. Purely statistical considerations do however loom large in the number of blind at the other extreme of life, for over 70 per cent of the new registrations are now in the elderly—those over the age of 70. In an earlier study (Sorsby, 1966) it was stressed that lay authorities—generally the National Assistance Board—were the greatest source of reference for registration as blind in the pensionable age groups, and this raised the possibility that amongst the 6 million in these age groups who did not seek the assistance of the welfare authorities there might be many potentially registrable individuals. Such a possibility is also suggested by the fact—already stressed—that the increase of new registrations over the years has shown an irregular pattern not readily explained by the larger general population and the change in age structure. It is indeed likely that a substantial number of registrably blind in the older age groups do not, for various reasons, seek registration—a 'submerged tenth' of considerable magnitude. This conclusion is, however, not borne out by the one attempt that has been made at assessing the efficacy of registration. In a postal enquiry—supported by personal visits where necessary—on the frequency of registrable blindness in the population served by one large group practice in Wales, Graham and his associates (1968) found no difference in the number of those actually registered and those revealed as registrable.

Regional variations

Maps prepared by Benjamin (1972) relate sex and age distributions of the registered blind population to the estimated populations by sex and age in the various local authority areas of England in 1965. They show regional differences in the prevalence of registered blindness, but these differences are not substantial nor are they consistent from age group to age group. The general inference is that, in so far as registration is correlated with the real prevalance of blindness, this is relatively evenly distributed throughout England, and that there is no geographical factor as such.

Possible measures

An assessment which would be close to the true incidence of blindness in England and Wales would appear possible. The growth of group practice and health centres for the general practitioner service in the National Health Service during recent years probably provides enough centres throughout the country that could be used for organizing a screening survey on blindness in the elderly population. It would be a fairly simple matter to establish the frequency of vision 3/60 or less in an adequate sample. Such a survey would still be an incomplete measure, for at all ages in adult life some 30 per cent of those who are registered as blind have central vision better than 3/60 (Sorsby, 1956 (Table 4); Sorsby, 1960 (Table 6); and Table 5 in the present study).

More than screening procedures would be needed to go beyond the approximation which would thus be reached. The assessment of borderline cases at the local ophthalmic department at selected centres could readily complete the statistical data required. Such investigations and collaboration might well extend the academic exercise of establishing accurate statistics into a practical measure for bringing treatment and relief where none was previously available.

The designation as blind

It is likely that we are entering a new—and third—phase in the assessment of blindness. Until 1911 the decennial censuses from 1851 onwards supplied information on the number of blind in the country. The numbers rose steadily from 18,306 in 1851 to 26,336 in 1911, though the rate per 100,000 was falling progressively from 102 to 73 over that period. The returns have been questioned as they were based on assessment of blindness by the individual concerned or someone responsible for him. Returns of this type became unnecessary with the coming of the second phase brought about by the Blind Persons Act of 1920.

As already noted, the Blind Register instituted in 1919 took over the records of the voluntary Blind Societies, and these gave a total of 25,840—very close indeed to the census figure of 1911. It is likely that both the census figures and the records of the Blind Societies dealt with blindness in the sense of total or sub-total loss of vision, i.e. no perception of light or perception of light only. Any lay assessment of such severe blindness is likely to be fairly accurate, though the readiness to declare it or to seek relief would of course vary considerably.

The Blind Register of today, with its total exceeding 100,000, is not comparable to the older returns and registers, if only because less than 15 per cent of the total fall in the categories of total or sub-total blindness. Against the 26,336 blind of the 1911 census (for a population of 36,070,492) and the 25,840 of the Blind Register of 1919 there would, therefore, be about 15,000 today. In other words the blind of today are mostly sighted by the standards of an earlier age. This leads to considerable difficulties because to the lay mind the term blind still carries the older connotation. There is also the further consideration that most of the blind in bygone days were young or middle-aged whereas today 79,338 of the 102,693 on the register in 1968 were over the age of 60.

This second phase, which has coincided with the doubling of the proportion of those aged 65 or over in the general population (it was 6·0 per cent in 1921 and 12·4 per cent in 1966), appears to be coming to an end. Of late dissatisfaction has been expressed over the use of the term blind for those who qualify for registration as blind on the BD8 form, and it is being suggested that the term blind be replaced by "severe visual disability" or a similar designation.

This raises two distinct issues. In the first place there is the emotional aspect—the unhappiness of some registered blind with some sight at being described as blind, an unhappiness that is derived from the fear the designation provokes for the future. This is a substantial consideration well worthy of being met if possible.

There is however another aspect. The 15 per cent or so who are blind in the fuller sense of the term would derive neither emotional satisfaction nor benefit from not being regarded as blind. Coming to terms with blindness is a bitter experience and this is not made any easier by evasions and circumlocutions. To accept blindness and all its consequences is the first step in adjusting oneself. It cannot, for instance, help the parents of a blind child if attempts are made to gloss over the child's blindness when it is essential to educate and train the child to a life of irremediable blindness. The realities of the situation are the blindness, the blind school and the blind occupation; and there is a substantial danger for blind children no less than for blind adults that their needs will receive less attention if illusory advantages are being pursued.

The present statutory definition of blindness—"so blind as to be unable to perform any work for which eyesight is essential"—is entirely occupational in character. This has only a limited significance for a blind population more than 60 per cent of whom are over the age of 70. It is indeed difficult to find one criterion or one designation that would satisfy the emotional and physical needs of the rather disparate groups that are entitled to the statutory benefits derived from certification as blind. To discard the term blind is to risk severe disturbances of the facilities developed over many decades for those with very little or no sight; to use the term blind for elderly people who will never be totally or subtotally blind is unnecessary and potentially harmful. One possible solution might be to designate the BD8 certificate as one for admission to the Register of blindness or of severe visual disability. This is not such a radical departure from current practice as it would seem, for many certifying ophthalmologists do in fact explain when necessary to those whom they register that registration is for visual disability rather than for blindness. To change the name of the certificate and of the Register would probably not involve any substantial legal considerations and would merely be a recognition of the changed background over the past 50 years.

References

Benjamin, B., 1972. *The geographical distribution of blindness in England and Wales in 1965.* Occasional paper No. 1. London, Southern Regional Association for the Blind.

Department of Health and Social Security, 1969. *On the state of the public health: the annual report of the Chief Medical Officer . . . for the year 1968.* London, H.M.S.O., p.261.

Graham, P. A., *et al.*, 1968 *British Journal of Preventive and Social Medicine*, **22**, 238.

Ministry of Health, 1964. *On the state of the public health: the annual report of the Chief Medical Officer . . . for the year 1963.* London, H.M.S.O., p.223.

Ministry of Health, 1965. *On the state of the public health: the annual report of the Chief Medical Officer . . . for the year 1964.* London, H.M.S.O., p.232.

Ministry of Health, 1966. *On the state of the public health: the annual report of the Chief Medical Officer . . . for the year 1965.* London, H.M.S.O., p.263.

Ministry of Health, 1967. *On the state of the public health: the annual report of the Chief Medical Officer . . . for the year 1966.* London, H.M.S.O., p.266.

Ministry of Health, 1968. *On the state of the public health: the annual report of the Chief Medical Officer . . . for the year 1967.* London, H.M.S.O., p.291.

Sorsby, A., 1950. *The causes of blindness in England and Wales.* (Medical Research Council, Memorandum No. 24) London, H.M.S.O.

Sorsby, A., 1953. *The causes of blindness in England, 1948–1950.* London, H.M.S.O.

Sorsby, A., 1956. *Blindness in England, 1951–1954.* London, H.M.S.O.

Sorsby, A., 1966. *The incidence and causes of blindness in England and Wales, 1948–1962.* (Reports on Public Health and Medical Subjects, No. 114) London, H.M.S.O.

Causes of blindness: major aetiological groupings, 196

Cause	1963 M	1963 F		1964 M	1964 F		1 M
Infectious diseases							
Syphilis (acquired)	3	1		8	2		4
Tuberculosis	2	1		4	7		4
Trachoma	2	—		1	—		1
All other	3	5		4	5		7
Total		10	7		17	14	16
Trauma							
Occupational	6	—		8	1		3
Military	2	—		3	—		1
All other	16	3		10	3		12
Total		24	3		21	4	16
Poisoning							
Therapeutic	—	—		1	5		3
All other	3	—		1	1		1
Total		3	—		2	6	4
Tumours							
Ocular	4	3		2	4		9
Intracranial	27	29		30	30		35
All other	5	6		—	4		4
Total		36	38		32	38	48
Systemic diseases not elsewhere classified							
Diabetes	135	178		119	215		170
Vascular disease	31	23		32	29		35
Neurological disorder	31	21		35	33		37
All other	36	21		63	31		42
Total		233	243		249	308	284
Pre-natal influences							
Genetic-established	76	59		67	77		78
Genetic-presumed	81	44		61	47		85
Transmitted maternal infection:							
Congenital syphilis	8	15		7	17		6
Rubella	7	4		6	9		9
Toxoplasmosis	—	—		—	—		—
Congenital: aetiology uncertain, including multiple defects and syndromes of unknown origin	117	94		131	109		126
Total		289	216		272	259	304
Aetiology Undetermined							
Myopic degeneration	130	172		136	181		111
Other undetermined	306	304		340	343		319
Total		436	476		476	524	430
TOTAL	1,031	983		1,069	1,153		1,102

M=Males F=Females P=Persons

References

Benjamin, B., 1972. *The geographical distribution of blindness in England and Wales in 1965.* Occasional paper No. 1. London, Southern Regional Association for the Blind.

Department of Health and Social Security, 1969. *On the state of the public health: the annual report of the Chief Medical Officer . . . for the year 1968.* London, H.M.S.O., p.261.

Graham, P. A., *et al.*, 1968 *British Journal of Preventive and Social Medicine*, **22**, 238.

Ministry of Health, 1964. *On the state of the public health: the annual report of the Chief Medical Officer . . . for the year 1963.* London, H.M.S.O., p.223.

Ministry of Health, 1965. *On the state of the public health: the annual report of the Chief Medical Officer . . . for the year 1964.* London, H.M.S.O., p.232.

Ministry of Health, 1966. *On the state of the public health: the annual report of the Chief Medical Officer . . . for the year 1965.* London, H.M.S.O., p.263.

Ministry of Health, 1967. *On the state of the public health: the annual report of the Chief Medical Officer . . . for the year 1966.* London, H.M.S.O., p.266.

Ministry of Health, 1968. *On the state of the public health: the annual report of the Chief Medical Officer . . . for the year 1967.* London, H.M.S.O., p.291.

Sorsby, A., 1950. *The causes of blindness in England and Wales.* (Medical Research Council, Memorandum No. 24) London, H.M.S.O.

Sorsby, A., 1953. *The causes of blindness in England, 1948–1950.* London, H.M.S.O.

Sorsby, A., 1956. *Blindness in England, 1951–1954.* London, H.M.S.O.

Sorsby, A., 1966. *The incidence and causes of blindness in England and Wales, 1948–1962.* (Reports on Public Health and Medical Subjects, No. 114) London, H.M.S.O.

APPENDICES

Appendix I

Appendix II

List of headings with their code numbers used for the classification of causes:–

Appendix III

APPENDIX I

TABLE I.A

Causes of blindness: major aetiological groupings, 1963–68. (All ages up to 65 yr. Both eyes blinded by the same cause)

Cause	1963 M	1963 F	1964 M	1964 F	1965 M	1965 F	1966 M	1966 F	1967 M	1967 F	1968 M	1968 F	1963–1968 Males	1963–1968 Females	1963–1968 Persons	%
Infectious diseases																
Syphilis (acquired)	3	1	8	2	4	—	3	1	2	1	7	1	27	6	33	
Tuberculosis	2	1	4	7	4	3	5	4	2	1	1	1	18	17	35	
Trachoma	2	—	1	—	1	—	1	2	1	5	3	4	9	11	20	
All other	3	5	4	5	7	17	5	8	7	13	3	5	29	53	82	
Total	10	7	17	14	16	20	14	15	12	20	14	11	83	87	170	1·3
Trauma																
Occupational	6	—	8	1	3	1	5	1	11	1	12	—	45	4	49	
Military	2	—	3	—	1	2	3	—	3	—	3	—	15	2	17	
All other	16	3	10	3	12	5	16	6	19	3	10	7	83	27	110	
Total	24	3	21	4	16	8	24	7	33	4	25	7	143	33	176	1·3
Poisoning																
Therapeutic	—	—	1	5	3	1	—	4	4	2	2	1	10	13	23	
All other	3	—	1	1	1	1	3	2	4	—	1	—	13	4	17	
Total	3	—	2	6	4	2	3	6	8	2	3	1	23	17	40	0·3
Tumours																
Ocular	4	3	2	4	9	2	4	3	4	6	—	7	23	25	48	
Intracranial	27	29	30	30	35	37	39	47	42	37	38	36	211	216	427	
All other	5	6	—	4	4	2	6	9	5	3	3	1	23	25	48	
Total	36	38	32	38	48	41	49	59	51	46	41	44	257	266	523	3·9
Systemic diseases not elsewhere classified																
Diabetes	135	178	119	215	170	209	155	213	138	221	169	246	886	1,282	2,168	
Vascular disease	31	23	32	29	35	22	32	23	38	31	32	34	200	162	362	
Neurological disorder	31	21	35	33	37	21	26	32	45	33	60	40	234	180	414	
All other	36	21	63	31	42	31	43	24	45	40	37	34	266	181	447	
Total	233	243	249	308	284	283	256	292	266	325	298	354	1,586	1,805	3,391	25·7
Pre-natal influences																
Genetic-established	76	59	67	77	78	54	77	62	87	68	73	63	458	383	841	
Genetic-presumed	81	44	61	47	85	65	56	67	23	15	72	52	378	290	668	
Transmitted maternal infection:																
Congenital syphilis	8	15	7	17	6	14	17	14	11	21	6	13	55	94	149	
Rubella	7	4	6	9	9	7	11	9	8	5	7	6	48	40	88	
Toxoplasmosis	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Congenital: aetiology uncertain, including multiple defects and syndromes of unknown origin	117	94	131	109	126	90	139	111	112	112	137	132	762	648	1,410	
Total	289	216	272	259	304	230	300	263	241	221	295	266	1,701	1,455	3,156	23·8
Aetiology Undetermined																
Myopic degeneration	130	172	136	181	111	336	137	208	132	175	132	158	778	1,230	2,008	
Other undetermined	306	304	340	343	319	177	332	347	348	326	311	325	1,956	1,822	3,778	
Total	436	476	476	524	430	513	469	555	480	501	443	483	2,734	3,052	5,786	43·7
TOTAL	1,031	983	1,069	1,153	1,102	1,097	1,115	1,197	1,091	1,119	1,119	1,166	6,527	6,715	13,242	100·0

M = Males F = Females P = Persons

TABLE I.B

Causes of blindness by site and clinical entity: 1963–68. (All ages up to 65 yr. Both eyes blinded by the same cause)

SITE	1963		1964		1965		1966		1967		1968		1963–1968		
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	P
EYEBALL IN GENERAL	178	159	181	144	171	146	190	177	168	143	159	147	1,047	916	1,963
Congenital defects:															
Nystagmus	9	5	10	3	15	9	6	7	14	8	9	11	63	43	106
Albinism	5	7	3	3	4	7	3	4	4	—	5	4	24	25	49
Anophthalmos	—	2	—	6	1	3	3	1	2	1	—	3	6	16	22
Buphthalmos	13	10	16	7	7	2	10	10	7	4	7	5	60	38	98
Microphthalmia	4	6	5	9	10	2	9	11	5	3	10	8	43	39	82
Aniridia	1	3	4	3	—	7	4	5	1	1	7	7	17	26	43
Colobomata, multiple	4	4	3	6	6	5	8	2	4	4	4	2	29	23	52
Multiple and ill-defined anomalies ..	11	17	15	14	12	10	15	14	16	18	15	18	84	91	175
All others	42	32	27	27	12	18	31	30	10	14	9	10	131	131	262
Acquired affections:															
Glaucoma	76	68	78	63	98	79	83	82	88	85	78	76	501	453	954
Trauma:															
Occupational	3	—	6	1	—	—	3	1	4	1	8	—	24	3	27
Military	1	—	2	—	—	2	2	—	2	—	4	—	11	2	13
Other	6	2	6	1	6	1	8	2	8	—	2	2	36	8	44
Tumours of adnexa	1	—	—	—	—	—	—	—	1	1	1	1	3	2	5
Diabetes	—	3	2	1	—	—	2	6	—	1	—	—	4	11	15
Vascular	—	—	2	—	—	1	1	1	1	2	—	—	4	4	8
Pemphigus	1	—	—	—	—	—	—	—	—	—	—	—	1	—	1
Other affections, specified	1	—	2	—	—	—	2	1	1	—	—	—	6	1	7
Other affections, not specified ..	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CONJUNCTIVA	—	1	2	1	—	6	2	3	2	6	2	5	8	22	30
Ophthalmia neonatorum	—	1	1	—	—	6	—	2	2	3	—	2	3	14	17
Pemphigus	—	—	—	1	—	—	—	—	—	—	1	—	1	1	2
Kerato-conjunctivitis sicca	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Other affections, specified	—	—	1	—	—	—	2	1	—	3	1	3	4	7	11
Other affections, not specified	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

M=Males F=Females P=Persons

Table I.B—*continued*

SITE	1963		1964		1965		1966		1967		1968		1963–1968		
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	P
CORNEA	32	35	33	55	24	43	38	14	31	53	29	41	187	271	458
Dystrophies..	1	1	—	3	2	3	1	—	4	3	—	—	8	10	18
Keratoconus	2	3	2	2	—	2	1	—	—	—	—	2	4	9	13
Interstitial keratitis	8	15	8	17	4	11	16	16	12	22	6	13	54	94	148
Mooren's ulcer	—	—	2	3	—	—	—	1	—	2	—	—	2	6	8
Trachoma	2	—	1	—	1	—	1	2	1	3	2	2	8	7	15
Trauma:															
Occupational	1	—	—	—	3	1	—	—	2	—	2	—	8	1	9
Military	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Other	—	—	—	—	—	1	3	—	—	—	—	—	3	1	4
Skin conditions:															
Acne rosacea	2	—	—	1	—	2	2	1	—	—	—	—	4	4	8
Pemphigus	—	—	—	—	1	—	1	—	—	—	—	—	2	—	2
Other skin affections	—	—	1	—	—	—	—	1	—	—	—	3	1	4	5
Kerato-conjunctivitis sicca	—	—	—	—	—	—	—	—	—	3	—	—	—	3	3
Other affections, specified..	16	16	19	29	13	23	14	23	12	20	19	21	93	132	229
Other affections, not specified	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

LENS	93	98	116	141	128	134	122	112	109	132	124	154	692	771	1,463
Cataract:															
'Senile'	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
General disease (Diabetes and others)	—	—	2	1	2	—	1	2	8	23	7	20	20	46	66
Pre-natal influences:															
Genetic	6	7	4	15	7	8	9	3	1	—	—	—	27	33	60
Rubella	6	3	5	8	9	7	9	4	5	5	4	6	38	33	71
Congenital	32	19	37	20	40	29	32	24	28	25	33	25	202	142	344
Congenital, part of a syndrome	1	1	7	2	—	—	5	4	1	4	7	12	21	23	44
Trauma	—	—	—	—	1	—	—	—	—	—	1	1	2	1	3
Undetermined and others	44	63	58	88	63	84	63	70	64	69	64	82	356	456	812
Dislocated lens:															
Congenital	2	1	2	7	3	3	2	—	2	6	8	5	19	22	41
Genetic	2	4	1	—	3	2	1	3	—	—	—	1	7	10	17
Other	—	—	—	—	—	1	—	2	—	—	—	2	—	5	5
UVEAL TRACT	163	208	171	242	156	242	164	248	191	216	167	206	1,012	1,362	2,374
Congenital anomalies	—	—	—	—	2	1	—	—	1	3	1	—	4	4	8
Dystrophies (choroideremia, choroidal sclerosis)	—	—	—	—	1	—	1	—	—	—	2	1	4	1	5
Iritis and iridocyclitis (including associated choroiditis):	26	39	29	45	25	43	35	35	35	18	27	42	177	222	399
Rheumatoid arthritis	3	2	3	7	2	3	—	4	1	3	1	2	10	21	31
Ankylosing spondylitis	3	1	1	—	1	—	1	2	—	—	1	—	9	2	11
Diabetes	—	—	—	—	—	—	—	2	—	—	1	—	1	2	3
Tuberculosis	—	—	—	—	—	—	—	—	—	1	—	—	—	1	1
Sarcoidosis	—	—	—	3	—	—	2	2	—	1	—	—	2	6	8
Congenital syphilis	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Other affections, specified	1	1	1	—	—	1	—	6	5	4	1	1	8	13	21
Not specified	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Choroiditis:															
Congenital syphilis	—	—	—	—	3	4	2	1	—	—	—	—	5	5	10
Acquired syphilis	—	—	1	1	—	—	—	—	—	1	1	—	2	2	4
Toxoplasmosis	—	—	—	—	1	—	—	—	—	—	—	—	1	—	1
Other general disease	1	1	3	1	—	2	—	—	4	5	5	—	13	9	22
Not specified	12	10	13	14	17	23	6	6	12	5	6	5	66	63	129
Myopic chorioretinal atrophy	117	154	120	171	104	165	17	192	131	175	121	154	710	991	170

M=Males F=Females P=Persons

Table I.B—*continued*

SITE	1963		1964		1965		1966		1967		1968		1963–1968		
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	P
RETINA	371	349	348	414	406	383	385	432	339	411	398	486	2,247	2,425	4,672
Retrolental fibroplasia	5	8	7	6	11	6	8	4	6	13	12	13	49	50	99
Retinal aplasia	11	8	11	9	20	12	11	17	5	4	4	10	62	60	122
Retinoblastoma	4	3	2	4	9	3	4	3	4	6	—	6	23	25	48
Retinal dystrophies:															
Retinitis pigmentosa	104	49	71	68	80	56	72	59	72	50	91	56	490	338	828
Allied affections	9	7	11	2	7	9	14	12	1	2	13	11	55	43	98
Macular lesions:															
"Senile" macular lesions	21	25	39	38	34	28	34	42	—	—	—	—	128	133	261
Dystrophies	10	13	10	13	10	11	8	20	38	57	48	53	124	167	291
In general disease	1	3	3	5	3	2	2	4	17	21	9	7	35	42	77
Unspecified	1	—	—	—	—	—	—	—	—	—	—	—	1	—	1
Detached retina:															
Myopia	13	17	16	10	7	12	20	16	1	—	11	4	68	59	127
Trauma	1	—	1	—	2	—	2	1	—	—	—	—	6	1	7
Genetic	—	—	—	—	1	—	—	1	—	1	—	—	1	2	3
Congenital	—	—	2	2	—	—	1	2	3	—	—	—	6	4	10
Undetermined	28	22	32	17	22	17	25	25	44	42	34	28	185	151	336
General diseases:															
Anaemia and haemorrhage	—	—	1	1	—	—	2	—	1	1	1	2	5	4	9
Nephritis	—	—	1	—	—	—	—	—	2	1	1	—	4	1	5
Hypertensive and vascular	29	19	26	25	31	18	30	21	17	16	14	22	147	121	268
Diabetes	134	175	115	214	169	209	152	205	152	128	197	159	857	1,224	2,081
Diseases of pregnancy	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Other	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Drug-induced retinopathies															
Trauma:															
Military	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Other	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Other affections	—	—	—	—	—	—	—	—	—	—	1	—	1	—	1

OPTIC NERVE, OPTIC PATHWAY AND CORTICAL VISUAL CENTRES	173	119	183	142	193	133	186	170	229	144	210	157	1,174	865	2,039
Optic atrophy:															
Infections:															
Acquired syphilis	3	1	6	1	4	—	3	1	2	—	6	1	24	4	28
Tuberculosis	2	1	3	5	3	2	3	3	2	—	1	1	14	12	26
Meningococcal meningitis	1	4	1	1	1	5	3	3	2	4	1	2	9	19	28
Other	—	—	1	—	3	1	—	—	1	—	1	—	6	1	7
Trauma:															
Occupational	2	—	2	—	—	—	1	—	4	—	1	—	10	—	10
Military	1	—	—	—	1	1	1	—	1	—	2	—	6	1	7
Other	8	1	4	2	3	2	6	3	10	3	4	4	35	15	50
Poisonings:															
Therapeutic	—	—	—	1	1	1	—	1	2	—	1	1	4	4	8
Others	2	—	—	1	—	—	—	—	3	—	1	—	6	1	7
Tumours:															
Intracranial	25	29	30	29	34	36	39	47	40	37	37	33	205	211	416
Adnexa	1	2	—	1	—	—	3	1	4	—	1	—	9	4	13
Metastatic	3	2	—	3	4	1	3	4	—	2	1	—	11	12	23
Site undetermined	—	1	—	—	—	—	—	—	—	—	—	1	—	2	2
General diseases:															
Anaemia and haemorrhage	2	1	—	1	—	—	—	1	—	—	—	—	2	3	5
Vascular	5	7	10	14	15	11	7	4	33	17	13	18	83	71	154
Multiple sclerosis	22	16	26	26	33	20	23	28	26	18	43	32	173	140	313
Other neurological disorders	8	3	7	6	3	1	2	—	14	9	13	7	47	26	73
Others	2	—	4	—	3	4	2	1	3	1	1	2	15	8	23
Pre-natal influences:															
Genetic	9	4	7	2	13	2	5	6	14	7	12	8	60	29	89
Congenital syphilis	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
"Congenital"	13	6	11	13	19	11	20	10	4	6	11	5	78	51	129
"Congenital" part of a syndrome	12	8	16	11	11	6	15	17	10	6	12	11	76	59	135
Others	1	2	3	1	3	—	—	—	—	1	1	1	8	5	13
Undetermined	51	31	52	24	39	29	50	40	54	33	47	30	293	187	480

M=Males F=Females P=Persons

Table I.B—*continued*

SITE	1963		1964		1965		1966		1967		1968		1963–1968		
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	P
VITREOUS	2	5	6	4	6	2	7	4	5	3	5	5	31	23	54
Haemorrhage	2	5	6	4	5	2	7	4	5	3	5	5	30	23	53
Other	—	—	—	—	1	—	—	—	—	—	—	—	1	—	—
GLOBE NORMAL	18	9	29	10	18	8	20	7	17	11	25	15	127	60	187
Presumed vascular disorders of the pathways	11	6	26	5	16	4	14	5	9	5	19	6	95	31	126
All others	7	3	3	5	2	4	6	2	8	6	6	9	32	29	61
ILL-DEFINED LESIONS	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
TOTAL	1,031	983	1,069	1,153	1,102	1,097	1,115	1,197	1,091	1,119	1,119	1,166	6,527	6,715	13,242

M=Males F=Females P=Persons

TABLE I.C

The major causes of blindness by age group and sex: 1963–1968

Cause	AGE GROUP (years)																							
	0–4				5–14				15–29				30–49				50–59				60–64			
	M	F	P	%	M	F	P	%	M	F	P	%	M	F	P	%	M	F	P	%	M	F	P	%
Congenital defects:																								
Congenital cataract ..	93	64	157	18·3	60	40	100	16·3	34	37	71	6·8	46	40	86	3·1	44	33	77	2·0	18	22	40	1·0
Dislocated lens ..	1	1	2	0·2	2	6	8	1·3	10	8	18	1·7	6	13	19	0·7	3	5	8	0·2	3	2	5	0·1
Retinal aplasia ..	32	34	64	7·7	13	13	26	4·2	10	7	17	1·6	3	1	4	0·1	2	—	2	0·1	—	1	1	—
Optic atrophy known or presumed congenital or hereditary	102	58	160	18·7	41	39	80	13·1	36	12	48	4·6	21	17	38	1·4	13	12	25	0·7	8	6	41	0·3
Other congenital structural anomalies including nystagmus	103	112	215	25·1	71	47	118	19·2	61	49	110	10·6	43	50	93	3·3	31	31	62	1·6	18	16	34	0·8
Acquired defects:																								
Retrolental fibroplasia	28	26	54	6·3	14	11	25	4·1	7	12	19	1·8	—	—	—	—	—	—	—	—	—	—	—	—
Retinoblastoma ..	13	18	31	3·6	8	3	11	1·8	2	3	5	0·5	—	—	—	—	—	—	—	—	—	—	—	—
Myopic chorioretinal atrophy	1	2	3	0·4	8	7	15	2·4	31	19	50	4·8	173	150	323	11·5	247	420	667	17·1	251	418	669	16·6
detachment ..	—	—	—	—	1	—	1	0·2	4	2	6	0·6	29	13	42	1·5	21	22	43	1·1	13	22	35	0·9
Optic atrophy known or presumed acquired	34	27	61	7·1	40	56	96	15·7	105	81	186	17·9	259	196	455	16·2	144	116	260	6·7	80	59	139	3·4
Optic atrophy of undetermined origin	12	12	24	2·8	12	10	22	3·6	55	19	74	7·1	79	16	140	5·0	78	44	122	3·1	54	50	94	2·3
Retinitis pigmentosa and allied conditions	1	5	6	0·7	15	7	22	3·6	92	46	138	13·3	194	147	341	12·2	151	115	266	6·8	92	61	153	3·8
Macular dystrophy ..	—	2	2	0·2	6	2	8	1·3	18	17	35	3·4	17	38	55	2·0	10	12	22	0·6	8	13	21	0·5
Uveitis of undetermined origin ..	1	1	2	0·2	7	8	15	2·4	16	15	31	3·0	61	52	113	4·0	59	90	149	3·8	36	68	104	2·6
Cataract other than congenital	5	5	10	1·2	1	1	3	0·3	6	6	12	1·2	42	48	90	3·2	139	142	281	7·2	178	297	475	11·8
Diabetic retinopathy	—	—	—	—	—	—	—	—	40	22	62	6·0	281	149	430	15·4	267	484	757	19·3	269	569	838	20·8
Glaucoma	—	—	—	—	2	—	2	0·3	5	2	7	0·7	45	39	85	3·0	167	171	338	8·7	281	241	522	12·9
Interstitial keratitis ..	2	1	3	0·4	—	—	—	—	3	2	5	0·5	12	14	26	0·9	16	41	57	1·5	17	31	48	1·2
All other corneal lesions	6	6	12	1·4	4	6	10	1·6	4	4	8	0·8	29	29	58	2·1	45	78	123	3·2	47	58	105	2·6
Detachment presumed non-myopic ..	—	3	3	0·3	3	3	6	1·0	13	5	18	1·7	35	18	53	1·9	40	37	77	2·0	30	32	62	1·5
Vascular retinopathy	1	—	1	0·1	—	1	1	0·2	3	—	3	0·3	18	8	26	0·9	48	36	84	2·2	76	69	145	3·6
Ophthalmia neonatorum ..	—	1	1	0·1	—	—	—	—	2	—	2	0·2	1	3	4	0·1	—	5	5	0·1	—	5	5	0·1
Vitreous haemorrhage	2	—	2	0·2	—	1	1	0·2	1	—	1	0·1	10	8	18	0·7	13	8	21	0·5	5	6	11	0·3
All other causes ..	24	21	45	5·0	25	19	44	7·2	72	40	112	10·8	192	112	304	10·8	224	226	450	11·5	261	259	520	12·9
Total	459	399	858	100·0	333	280	613	100·0	630	408	1,038	100·0	1,597	1,206	2,803	100·0	1,762	2,128	3,890	100·0	1,745	2,295	4,040	100·0

M = Males F = Females P = Persons

TABLE I.D

*The major causes of blindness by sex: 1963–68. Adjusted female incidence against actual male incidence**

Cause	AGE GROUP (years)													
	0–4		5–14		15–29		30–49		50–59		60–64		All ages	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Congenital defects:														
Congenital cataract	93	67	60	42	34	38	46	41	44	31	18	19	295	238
Dislocated lens	1	1	2	6	10	8	6	13	3	5	3	2	25	35
Retinal aplasia	32	36	13	14	10	7	3	1	2	—	—	1	60	59
Optic atrophy, known or presumed congenital or hereditary	102	61	41	41	36	12	21	17	13	11	8	5	221	147
Other congenital structural anomalies, including nystagmus	103	118	71	49	61	50	43	51	31	29	18	14	327	311
Acquired defects:														
Retrolental fibroplasia	28	27	14	12	7	12	—	—	—	—	—	—	49	51
Retinoblastoma	13	19	8	3	2	3	—	—	—	—	—	—	23	25
Myopic chorioretinal atrophy	1	2	8	7	31	20	173	152	247	393	251	364	711	938
detachment	—	—	1	—	4	2	29	13	21	21	13	19	68	55
Optic atrophy known or presumed acquired	34	28	40	59	105	83	259	199	144	109	80	51	662	529
Optic atrophy of undetermined origin	12	13	12	11	55	20	79	62	78	41	43	35	290	182
Retinitis pigmentosa and allied conditions	1	5	15	7	92	47	194	149	151	108	92	53	545	369
Macular dystrophy	—	2	6	2	18	17	17	39	10	11	8	11	59	82
Uveitis of undetermined origin	1	1	7	8	16	15	61	53	59	84	36	59	180	220
Cataract, other than congenital	5	5	1	1	6	6	42	49	139	133	178	259	371	453
Diabetic retinopathy	—	—	—	—	40	25	281	149	267	454	269	497	857	1,125
Glaucoma	—	—	2	—	5	2	46	40	167	160	281	210	501	412
Interstitial keratitis	2	1	—	—	3	2	12	14	16	38	17	27	50	82
All other corneal lesions	6	6	4	6	4	4	29	29	45	73	47	51	135	169
Detachment, presumed non-myopic	—	3	3	3	13	5	35	18	40	35	30	28	121	92
Vascular retinopathy	1	—	—	1	3	—	18	8	48	34	76	60	146	103
Ophthalmia neonatorum	—	1	—	—	2	—	1	3	—	5	—	4	3	13
Vitreous haemorrhage	2	—	—	1	1	—	10	8	13	7	5	5	31	21
All other causes	22	22	25	20	72	39	192	116	224	210	263	224	797	631

M=Male F=Female

* For methods of adjustment see footnote to Table 9 on p11.

TABLE I.E

Blindness from a different cause in the two eyes: 1963–68

Causes of blindness responsible for more than 0·5 per cent of specified causes: each eye listed separately

Cause	1963		1964		1965		1966		1967		1968		1963–68					
													Males		Females		Persons	
	M	F	M	F	M	F	M	F	M	F	M	F	No.	%	No.	%	No.	%
Trauma	29	7	38	10	40	16	24	12	36	3	35	8	202	32·9	56	16·6	258	27·1
Glaucoma	2	2	9	4	12	12	7	5	5	1	5	3	40	6·5	27	8·0	67	7·0
Myopic chorioretinal atrophy	3	6	8	7	10	16	3	—	3	—	2	1	29	4·7	30	8·9	59	6·2
All detachment (trauma excluded)	2	2	11	5	12	9	13	6	—	—	—	2	38	6·2	24	7·1	62	6·5
Infectious diseases ..	2	2	5	2	2	—	2	—	4	2	—	1	15	2·4	7	2·1	22	2·3
Tumours (ocular) ..	—	1	2	—	—	2	—	3	—	—	—	—	2	0·3	6	1·8	8	0·8
Hypertensive and vascular retinopathy	5	8	9	2	16	9	10	2	6	—	3	2	49	8·0	23	6·8	72	7·6
Optic atrophy (trauma excluded)	2	1	5	1	3	5	4	4	4	—	3	1	21	3·4	12	3·5	33	3·5
Iritis and iridocyclitis ..	4	2	—	3	5	7	2	1	—	—	3	1	14	2·3	14	4·1	28	2·9
Amblyopia ex anopsia ..	7	5	4	3	5	5	5	7	2	1	5	3	28	4·6	24	7·1	52	5·5
All other causes	12	8	33	25	55	43	32	28	22	3	22	8	176	28·7	115	34·0	291	30·6
All causes ..	68	44	124	62	160	124	102	68	82	10	78	30	614	100	338	100	952	100

M = Males F = Females

TABLE I.F

Data on the partially sighted: 1957–68

Year	AGE GROUP (years)					
	0–15		0–4		5–15	
	No	Rate per 100,000	No	Rate per 100,000	No	Rate per 100,000
	New Registrations					
1957	345	3·2	60	1·8	285	3·8
1958	325	3·0	72	2·1	253	3·3
1959	319	2·9	68	2·0	251	3·3
1960	335	3·0	90	2·5	245	3·2
1961	290	2·6	67	1·8	223	2·9
1962	291	2·5	69	1·8	222	2·9
1963	352	3·1	68	1·7	284	3·8
1964	373	3·2	85	2·1	288	3·9
1965	337	2·9	114	2·8	223	3·0
1966	397	3·4	110	2·6	287	3·8
1967	391	3·5	123	2·9	268	3·8
1968	416	3·5	102	2·5	314	4·0
	Registered Population					
1957	2,205	20·4	104	3·1	2,101	28·0
1958	2,222	20·3	96	2·8	2,126	28·1
1959	2,269	20·5	99	2·9	2,170	28·6
1960	2,292	20·6	113	3·2	2,179	28·7
1961	2,330	20·6	108	3·0	2,222	29·1
1962	2,275	19·9	94	2·5	2,181	28·5
1963	2,283	20·0	81	2·1	2,202	29·2
1964	2,327	20·3	98	2·4	2,229	29·8
1965	2,326	20·1	146	3·5	2,180	29·1
1966	2,405	20·5	152	3·6	2,253	29·8
1967	2,491	22·2	157	3·8	2,334	33·2
1968	2,558	21·3	144	3·5	2,414	30·7

APPENDIX II

TABLE II.A CLASSIFICATION BY TYPE AND SITE OF AFFECTION
(Revised List, 1968)

Eyeball in general

110 Glaucoma (excluding infantile)
120 Nystagmus

Congenital anomalies

141 Albinism
142 Anophthalmos (excluding surgical)
143 Megalophthalmos (buphthalmos, infantile glaucoma, hydrophthalmos)
144 Microphthalmos
145 Aniridia
146 Coloboma, any part (excluding surgical)
147 Multiple structural anomalies

Acquired degenerative changes

170 Exophthalmos
171 Multiple muscular palsies
180 Globe as a whole

Conjunctiva

200 Ophthalmia neonatorum
210 Purulent ophthalmia of adults
220 Other affections

Cornea and Sclera

311 Interstitial keratitis
314 Sclerosing keratitis (including scleromalacia perforans)
316 Keratoconjunctivitis (including keratoconjunctivitis sicca)
330 Megalocornea
340 Mooren's ulcer
370 Keratoconus
380 Other affections of the cornea
391 Scleritis

Crystalline Lens

410 Cataract
420 Dislocated lens
480 Other affection of lens

Uveal Tract

510 Iritis, iridocyclitis and pan-uveitis
550 Choroiditis and chorioretinitis
581 Choroideremia and allied affections
589 Choroidal atrophy
590 Other anomalies of iris or choroid, specified

Retina

630 Retrolental fibroplasia
631 Retinal aplasia
632 Possibly aplasia
640 Retinal detachment
650 Retinitis pigmentosa
651 Conditions allied to retinitis pigmentosa
661 Macular lesion
680 Other retinal conditions (retinopathy)

Optic nerve, optic pathway and cortical visual centres

710 Optic atrophy
720 Optic neuritis (papillitis)
730 Papilloedema (choked disc)
740 Neuro-retinitis
750 Retrobulbar and intra-cranial lesions
780 Other affections of optic nerve

Vitreous

810 Vitreous haemorrhage
820 Other affections of vitreous

Site not specified

920 Globe normal
930 High refractive error
980 Other affections
990 Inadequate data

Infectious diseases (excluding transmitted maternal infections)

110 Diphtheria
120 Gonorrhoea
130 Measles
140 Meningococcal meningitis
160 Scarlet fever
170 Septicaemia
180 Smallpox
181 Herpes affection
182 Other virus disease
190 Syphilis (see also 841)
200 Trachoma
210 Tuberculosis (including tuberculous meningitis)
211 Sarcoidosis
220 Typhoid fever
230 Rubella (see also 842)
240 Onchocerciasis
250 Toxoplasmosis (see also 843)
260 Brucellosis
270 Leprosy
280 Other infectious disease, specified (e.g. meningitis, unspecified; intracranial abscess, unspecified; sinus thrombosis)
290 Infectious disease, not specified

Trauma

30 Birth processes
31 Occupational hazard
32 Household activity
33 Play or sport
34 Traffic or travel
35 Military operations
36 Sympathetic ophthalmia
38 Other activity, specified
39 Activity not specified
40 Cardiac surgery

Poisonings

51 Occupational activity
52 Non-occupational activity—including self-administered
53 Military operations
54 Therapeutic agents (including anaesthetics)
59 Activity not specified

Tumours

610 Ocular
620 Adnexa
630 Intra-cranial
640 Metastatic
680 Site undeterminable

General diseases

710 Anaemia and other blood disease
720 Diabetes mellitus
730 Nephritis and other kidney disease
740 Vascular disease (including arteriosclerosis but excluding cerebro-vascular lesions)
741 Mitral stenosis and heart disease
742 Cerebro-vascular lesions (including subarachnoid haemorrhage and carotid syndrome)
750 Multiple sclerosis
751 Other neurological disorders
752 Functional and hysterical disorders
753 Myopathies
760 Diseases of pregnancy
770 Nutritional deficiency
771 Endocrine disturbances

Other specified diseases

781 Acne rosacea
782 Pemphigus
783 Other skin disease specified (including pseudo-xanthoma elasticum)
784 Skin disease, not specified
785 Rheumatoid arthritis (including Still's disease)
786 Ankylosing spondylitis
787 Other specified inflammatory affection (e.g. Paget's disease of bone, sclero malacia perforans, Reiter's disease, Temporal arteritis—Stevens-Johnson disease, Keratoconjunctivitis sicca)
789 Other diseases not elsewhere classified, specified (e.g. Eales' disease, Behçet's syndrome)
790 General diseases not specified

Pre-natal influences

810 Genetic origin, established (positive family history)
811 *Ibid:* part of a synodrome
812 Chromosomal anomaly
820 Genetic origin, presumed (no record of family history)
821 *Ibid:* part of a syndrome
830 Metabolic disorder: genetic origin established
831 *Ibid:* genetic origin presumed

Transmitted maternal infections

841 Syphilis
842 Rubella
843 Toxoplasmosis
848 Other specified
849 Other not specified

850 Prematurity
890 Pre-natal influence, type not specified (i.e. "congenital")

Aetiology undetermined

910 Undertermined
920 Assumed to be "senile"
930 Assumed to be "myopic"

APPENDIX III

SERVICES AVAILABLE FOR INCIPIENT BLINDNESS IN GREATER LONDON, 1968: A RETROSPECTIVE STUDY

Scope, material and methods

The Blind Persons Act of 1920 which made statutory benefits available to those afflicted with blindness has led to the setting up of the Blind Register with its invaluable statistical data. Equally helpful data on the causes of blindness have become available from the systematic scrutiny of the BD8 forms (the certificates of blindness).

No documentary material comparable to the BD8 certificates is available on the personal, medical and social problems of the registered blind before registration. Though there is some information in general terms on the stress undergone by those whose sight is failing, little is known on any specific detail. During the years in which a blinding affection matures, there are not only psychological difficulties but also more tangible problems concerning employment, financial stability, and facilities for treatment. How extensive these difficulties are and how amenable to suitable action is not known except in some individual cases, and these would not necessarily be typical. An adequate assessment of these social—as opposed to clinical—aspects of blindness therefore calls for a case study approach both into the patient's problems and into the availability and use of agencies that could help—including the medical services.

The present investigation is a first attempt in this type of case work. It is limited to the 32 boroughs of Greater London. Altogether 308 persons out of the newly registered in London during 1968 were interviewed. Because of geographical limitation, the exclusion of all those who had previously been registered as partially sighted and of immigrants who already had eye trouble on settling here, and the elimination of those whose consent to participate in the project was unobtainable, the original design of having 50 subjects of each sex for each of four age groups (16–49, 50–64, 65–69, 70–79 years) was not practicable. Of the

308 persons interviewed, 288 (136 men and 152 women) were over the age of 40 and they form the subject of this study. Their age distribution was:

Age group (years)	*Men*	*Women*
40–64	51	52
65–69	35	50
70–79	50	50
All ages ..	136	152

All subjects were interviewed by one of a team of seven professional interviewers and the replies recorded on a structured questionnaire carrying 136 items. The replies were tabulated by computer in preparation for analysis.

These 288 subjects are of course not a random sample of the blind population. Quite apart from the facts that the sample was drawn from the limited area of Greater London and from registrations during one year only, it could only be selective (though randomly so in the different boroughs) for both men and women of 70–79 years and for women aged 50–69 years and was entirely unselective for men aged 40–69 years and women at 40–49 years. However, these limitations do not affect the value of the findings for the particular age groups. These age groups are considered separately, for to combine them would give an unrepresentative amalgam, especially with regard to individual aspects. Likewise the data obtained on the social services are considered separately from those on personal aspects.

Analysis

1. THE SOCIAL SERVICES

Medical services

The findings on the use of the medical services are shown in Table III.A.

(*a*) *General practitioner service*

Of the 288 patients in this series, 231 visited their general practitioner at the time when their eye trouble set in, and 217 of these mentioned it to him, with the result that 168 were referred to hospital and 13 to opticians. The general practitioner service was considered satisfactory by 144 patients and unsatisfactory by 9: 37 would pass no comment, and in 27 instances there was no information. There do not appear to be any substantial sex and age differences in these findings.

(*b*) *Hospital treatment*

All but 6 men and 5 women had attended hospital prior to registration. There were 204 subjects who had done so on the advice of their general practitioner (some before the onset of ocular symptoms), 35 on other medical advice and 23 on advice from non-medical sources; 15 had sought hospital help on their own. Of these 277 patients, 234 expressed themselves as satisfied with the hospital they

last attended. Sixty-eight patients sought advice at a second, third or further hospitals, 27 under medical direction, 20 because they were dissatisfied and 29 for indefinite reasons (including more than one reason in 8 instances).

Of 273 subjects who had attended as out-patients, 218 had been regular in their attendance. In-patient treatment was obtained by only 80, and of these, 50 had last been admitted within 12 months prior to registration. As with the general practitioner services there was no substantial age or sex difference in the use made of the hospital services.

Registration as blind

It will be seen from Table III.B(a) that 107 of the 288 subjects reported that sight had been failing over 10 years, 91 for between 3 and 10 years and 90 for 3 years or less. Thus in only about one-third of the patients was the onset of blindness fairly rapid.

The request for certification came from hospitals in 166 instances and from other medical sources in 22. The remaining 100 requests were from lay sources. Of these 20 came from the patients themselves, 15 from friends or relatives and most of the rest from social workers.

For various reasons social workers had been in touch with 46 people subsequently registered as blind (29 men and 17 women). Discussing their difficulties with the workers was found helpful by 19 of the men and 7 of the women.

It would appear (Table III.B(b)) that the existence of facilities for registering as a blind person is not widely known. Few of the subjects over the age of 65 appeared to have heard of it (only 13 of the 85 men and 1 of the 100 women in this age group). At 40–64 it was recorded as known to 13 of the 51 men and 11 of the 52 women.

2. PERSONAL ASPECTS

The personal problems that accumulate as sight fails are greatly influenced by age and sex. The available data are therefore best considered in relation to these two factors. Since the number of women in each of the three age groups is about the same (52 at 40–64 years and 50 for each of the two higher age groups) comparison between the different female age groups can readily be made. The men aged 65–69 years contribute only 35 cases against 51 and 50 for the two other age groups; to facilitate comparison between the three age groups in men adjusted figures for an assumed total of 50, as well as the actual total of 35 at 65–69 years, are shown in the tables (by multiplying the actual figures by $\frac{50}{35}$ or 1·43).

Medical considerations

(*a*) *Additional handicaps*

As can be seen from Table III.C(a), 129 of 288 subjects reported substantial physical handicaps in addition to their blindness. (This may be an underestimate as 52 more persons reported symptoms difficult to interpret.) The incidence of the handicaps differed in the two sexes.

Men.—Fifty-three out of 136 men reported defects; 18 had diabetes, 30 had various incapacitating defects affecting mobility ("arthritis", "heart trouble",

and "physical handicaps") and 8 reported various degrees of deafness. The burden of deafness was actually rather higher (16 in all) because 8 of the 30 men with various incapacitating defects had deafness as an additional handicap.

Women.—Seventy-six women of the 152 affected with blindness reported substantial additional defects. Diabetes was outstanding with a total of 44 cases; various incapacitating defects affecting mobility were also present in 44, and deafness in 4 instances (and 2 more among the 44 women with incapacitating defects).

The overall excess of defects in women applies only to the two lower age groups, the actual figures being 25 against 19 in men at 40–64 years, and 30 against 11 actual or 16 adjusted men at 65–69 years. At 70–79 the numbers were similar (23 men and 21 women).

The concentration of 41 out of the 44 cases of diabetes in women at the ages of 40–69 years dominates the pattern of sex incidence and age distribution; the corresponding figure for men was 14 (or 15 adjusted). In the highest age group there seems to be no sex difference in diabetes, but there is perhaps an excess of deafness in men.

(*b*) *Family history*

A family history of serious eye trouble was reported by 45 subjects (or 47 adjusted) but, as can be seen from Table III.C(b), genetically determined disease would appear to have been present in only 13 instances; there were 9 cases of presumed dominant inheritance (3 men and 6 women) and 4 cases of presumed recessive disorders (3 men and 1 woman).

Learning braille

In this series of 288 blind persons only 9 patients had learned braille prior to registration—7 men and 2 women. Of these 6 men and 1 woman were in the 40–64 year age group.

Employment

Men

As can be seen from Table III.D most of the men under 69 were gainfully employed before the onset of their eye trouble; at 40–64 years 43 out of 51 were in employment and at 65–69 years 29 out of the 35; at 70 and over only 24 of the 50 were at work. The difficulties experienced at work on account of failing sight were eased to some extent by help from mates: this is seen from the findings recorded in section (b) of the table on the 50 men who had stayed with the same firm whilst sight was declining. Registration as blind was effected within one year in only 29 of the 67 who had to stop regular work.

Women

Of the 52 women in the age group 40–64 years, only 24 had gainful employment; 13 had such employment at 65–69 years and only 8 at 70–79 years. As with the men, help from other staff alleviated to some extent the difficulties experienced during the period of failing sight. Registration as blind was effected within one year in only 13 of the 38 women who had to stop regular work.

Discussion

Validity of the material

An incidence of 44 cases of diabetes among the 152 women interviewed in this series (as given in their replies) seems excessive, and rather suggests that the other information based on their replies to the questions might be unreliable. Some doubt also arises concerning the incidence reported for incapacitating defects at 70–79 years; 14 and 18 for the 50 men and 50 women respectively would seem unduly low. Actually these figures confirm the validity of the answers for they are supported by those in the summary table of the causes of blindness recorded in the BD8 certificates (Table III.E, p. 72).

In the BD8 certificates diabetic retinopathy was present in 38 of the 102 women aged 40–69 and this agrees well with the reported incidence of 41 cases at these ages in Table III.C(a), and with the high incidence of diabetic retinopathy in middle-aged women recorded in national returns. Likewise 42 cases of senile macular degeneration in the 100 patients at 70–79 years would explain the relatively low incidence of general disorders in this age group as senile macular degeneration is typically an affection limited to the eye.

The adequacy of the medical services

It needs to be stressed that this assessment of the adequacy of the medical services for incipient blindness deals only with those who have become registered as blind. It is not known how many blind people have sought neither medical advice nor registration, and it is an open question whether the registered blind represent fairly fully or inadequately the total blind population of the country. (See discussion on pp. 26 and 39.)

(*a*) *General practitioner service*

In Greater London, at any rate, the National Health Service, with its unique facilities for a universal general practitioner service, appears to be working reasonably well in screening patients with eye disease. Most patients do consult their practitioner on their eye troubles—in this series no less than 217 out of the 288. It was particularly striking to find that 74 of the 100 patients at 70–79 years had sought their practitioner's advice for their eye trouble, for this is an age group that traditionally has accepted failing sight as an inevitable aspect of getting old, and only exceptionally has the financial resources to explore the possibilities of treatment. It is also clear that general practitioners usually referred the patients to hospitals.

(*b*) *Hospital service*

It has been seen that all but 11 of the 288 patients used the hospital eye service. The paramount rôle of the general medical service in ensuring this high use of the hospitals may be deduced from the fact that 204 of the 277 patients seen at eye departments had been directed to them by their general practitioners. Thirty-five of the remaining 76 had been directed by other medical advice—generally another department of the hospital; only 41 patients had come to hospital on their own initiative or on other lay guidance.

The out-patient facilities appear to have been used systematically and intelligently. As for the in-patient services less than a third of the patients (42 men and 38 women) had been admitted to hospital during the 3 years preceding registration, and among them were 35 who had been admitted more than once. The

relatively low use of in-patient facilities probably reflects the fact that such services are largely surgical in character, whereas much of the blindness prevalent today is not amenable to surgery.

Registration as blind

Registration as blind, for which the responsibility rests on the Local Authority, was effected in 188 instances at the request of medical sources, mostly hospitals. But in 100 cases (more than a third of the total of 288 registrations) the request came from lay sources; 20 were from the patients themselves, 25 from the Supplementary Benefits Commission (or its precursor the National Assistance Board), 16 from welfare departments of Local Authorities, 15 from relatives and friends and 24 from other lay sources. The high incidence of requests from non-medical sources—and these figures are better than those recorded earlier in the national returns—raises the question whether hospitals are as adequate for the social service of registration as they are for their strictly medical functions. It is indeed likely that registration as blind tends to be overlooked in the pressure both on the out-patient ophthalmic services and on the social work departments which are usually working under extreme difficulties, often lacking adequate space and staff. Moreover, some ophthalmologists may hesitate to raise the question of certification, particularly in borderline cases, and such hesitations are unlikely to be eased by any initiative from the patients themselves, for few of them appear to know of registration and its advantages. It is also perturbing that only 29 of the 67 men and 13 of the 38 women who had to give up regular work came to be registered within 12 months.

Clearly, the hospital services failed to certify a considerable number of their patients who were registrable. On the simple issue of registration it does not appear that the current responsibilities and facilities of the surgeons and the social workers at eye departments met the actual needs of their patients. There is also a further consideration; if a third or so of the eligible hospital patients obtained registration through lay sources, it is possible that there were others who were overlooked both by the hospitals and by the lay sources.

Social services before registration

Local authorities are responsible for the registration of blind and partially sighted people and hold stocks of the certification (BD8) forms. Certification after examination by a consultant ophthalmologist is a prerequisite for registration. Visually handicapped people known to the local authority are referred to a consultant for certification, but many are known only to the ophthalmologist treating them. It would be helpful if all patients having treatment for seriously defective sight, whether progressive or not, were automatically referred by the ophthalmologist either to the hospital or the local authority social worker.

The social worker should ensure that these patients fully understand the services available in helping them to live with a severe visual handicap, including the benefits they may receive from registration. It is obvious that there is a real need for social services in the trying years when sight is failing and that these are not always readily available or fully used.

In the present study almost all of those engaged in gainful occupation had lost their usual employment before registration, and of these little more than a third

came to be registered within 12 months, though the rate was distinctly better (24 out of 41) for the age group 40–64 years. In the lower age groups the loss of employment must have represented a crisis precipitated after trying months or years of increasing disability. Obviously adequate social services can help to mitigate this, and that such services are often lacking is also obvious. If the learning of braille when there is still an adequate degree of sight is taken as a test of help during the period when blindness develops, there is little comfort in the fact that of the 103 patients in age group 40–64 years only 7 men and 2 women undertook this. Admittedly, the learning of braille is not a particularly sensitive index of the efficiency of pre-registration social services. They are undoubtedly better than these figures would suggest.

It is, however, beyond doubt that the services for those who are going blind could be considerably improved. If it is true that no one has ever become blind without crying—need the tears be as bitter as they are?

In the preparation of this retrospective study on London in 1968 I have had invaluable help from Dr. B. Benjamin, Professor R. M. Titmuss and Miss M. Henham-Barrow. They have given freely of their time and expertise. Mrs. R. Ann Abel, who as a Research Officer of the Department, has carried out the work involved, is preparing a fuller account of the procedures used and the findings obtained.

TABLE III.A

Medical Services

(a) General Practitioner Services

Age group (years)	Number of patients in series		Number of patients who				Service advised by GP								GP service regarded by patients as							
			Visited GP		Mentioned eye trouble		Hospital		Other medical		Optician		Indefinite or none		Satis-factory		No comment		Unsatis-factory		No record*	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
40–64 ..	51	52	37	44	34	39	27	32	—	—	—	2	7	5	24	22	1	11	4	2	5	4
65–69 ..	35	50	27	44	27	43	22	34	1	—	3	2	1	7	22	28	4	9	—	1	1	5
70–79 ..	50	50	38	41	35	39	25	28	2	—	4	2	4	9	24	24	7	5	—	2	4	8
All ages ..	136	152	102	129	96	121	74	94	3	—	7	6	12	21	70	74	12	25	4	5	10	17

*Sixteen of these patients were already attending hospital and were not questioned on this issue; 9 stated that nothing had been suggested, and two more were indefinite.

(*b*) *Hospital Services*

Age group (years)	Number of patients in series		Attendance at hospital before registration										Number of hospitals specifically attended for eye trouble						Reasons for change of hosptial						Patients assessment of service obtained at last hospital					
			Number		On advice of								One		Two		Three or more		Directed		Dissat-isfied		Indefi-nite†		Satisfied		No comment		Not Satisfied	
					GP		Other medical		Self		Other and inde-finite																			
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
40–64 ..	51	52	49	50	33	37	5	8	6	2	5	3	37	35	8	11	4	4	7	7	3	4	4	6	42	40	3	5	4	5
65–69 ..	35	50	34	49	28	38	2	8	2	2	2	1	29	32	5	10	—	7	2	6	—	7	3	6	29	45	—	1	5	3
70–79 ..	50	50	47	48	33	35	4	8	2	1	8	4	39	37	6	8	2	3	2	3	3	3	4	6	35	43	6	2	6	3
All ages ..	136	152	130	147	94	110	11	24	10	5	15	8	105	104	19	29	6	14	11	16	6	14	11	18	106	128	9	8	15	11

Age group (years)	Number of patients in series		Out-patient attendance								In-patient admission									
			Number of patients		Frequency of visits						Number of admissions during the three years before registration						Interval between admission and registration			
					Regular		Irregular		Indefinite		One		Two		Three or more		< 12m		> 12m	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
40–64.. ..	51	52	48	49	37	40	3	5	8	4	9	14	5	4	7	3	13	16	8	5
65–69.. ..	35	50	34	48	24	46	3	—	7	2	7	1	3	6	1	1	6	7	5	1
70–79.. ..	50	50	47	47	35	36	2	2	10	9	8	6	1	3	1	—	4	4	6	5
All ages ..	136	152	129	144	96	122	8	7	25	15	24	21	9	13	9	4	23	27	19	11

†Including 8 patients who gave more than one reason.

M = Males F = Females

TABLE III.B

Registration

(a) Source of reference and duration of failing sight before registration

Age Group (years)	Number of patients in series		Duration of failing sight before registration						Source of reference for registration (Local Authorities' records)															
			Up to 3 yr		3–10 yr		10 yr or more		Medical				Lay											
									Hospital		GP or other medical		Own request		Welfare Dept		SBC/ NAB		Health Dept		Labour exchange		Rela-tions or friends		Others	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
40–64	51	52	19	17	12	12	20	23	31	38	3	3	8	2	1	2	1	1	1	2	4	—	1	3	1	1
65–69	35	50	10	16	13	18	12	16	18	32	3	6	2	1	—	6	7	2	2	2	—	—	1	1	2	—
70–79	50	50	13	15	20	16	17	19	23	24	4	3	4	3	4	3	5	9	2	2	—	—	5	4	3	2
All ages	136	152	42	48	45	46	49	58	72	94	10	12	14	6	5	11	13	12	5	6	4	—	7	8	6	3

(b) Visits by social workers before registration

Age Group (years)	Number of patients in series		Number who had not heard of registration		Number who had such visits		Number who found discussing difficulties with the visitor helpful		Suggestions made by social workers											
									Home Help		Meals on wheels		Both		How to cope		Financial			
																	Supp. Ben.		Other	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
40–64	51	52	38	41	7	5	4	2	1	1	—	1	—	—	—	—	5	3	4	1
65–69	35	50	31	49	7	6	4	2	1	3	—	1	3	—	—	1	5	1	1	1
70–79	50	50	41	50	15	6	11	3	3	1	1	—	2	2	3	—	6	4	8	2
All ages	136	152	110	140	29	17	19	7	5	5	1	2	5	2	3	1	16	8	13	4

M=Males F=Females

TABLE III.C

Health Problems

(*a*) *Incidence of additional defects as reported by the subjects*

Age Group (years)	Number of patients in series		Diabetes						Incapacitating defects affecting mobility ("Arthritis" "Heart" and "Physical handicaps")								Deafness		Total showing one or more defects	
			By itself		With other defects		Total		On their own		With other defects		With Deafness		Total					
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
40–64	51	52	8	13	3	8	11	21	8	9	1	1	1	—	10	10	—	—	19	25
65–69	35(50)	50	2	9	1	11	3(4)	20	2	7	2	8	2	1	6(9)	16	2(3)	2	11(16)	30
70–79	50	50	2	1	2	2	4	3	5	13	4	4	5	1	14	18	6	2	23	21
All ages	136	152	12	23	6	21	18	44	15	29	7	13	8	2	30	44	8	4	53	76

(*b*) *Family history of serious eye trouble*

Age Group (years)	Numbers of patients in series		Number recording such history		In one generation						Over two or more generations					
					Same cause		Different cause		Cause unknown		Same cause		Different cause		Cause unknown	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
40–64	51	52	7	7	1	—	—	1	2	3	2	2	2	1	—	—
65–69(1)	35(50)	50	4(6)	8	1	—	—	2	1	—	1	2	1	4	—	—
70–79	50	50	9	10	1	1	1	1	2	3	—	2	1	1	4	2
All ages	136	152	20	25	3	1	1	4	5	6	3	6	4	6	4	2

The figures in parentheses are adjusted to a raised total of 50.

M=Males F=Females

TABLE III.D

Employment

(a) Time over which difficulties with work were experienced before registration

Age group (years)	Number of patients in series		Number at gainful work at the beginning of the eye trouble		Time									
					Up to 1 yr		1 to 3 yr		3 to 10 yr		10 yr or more		Indefinite ("no effect")	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F
40–64 ..	51	52	43	24	16	8	8	6	8	6	9	1	2	3
65–69 ..	35(50)	50	29(41)	13	4(6)	1	8(11)	3	9(13)	4	6(9)	4	2(3)	1
70–79 ..	50	50	24	8	2	—	3	2	11	1	7	4	1	1
All ages ..	136	152	96	45	22	9	19	11	28	11	22	9	5	5

(b) Type of help given to those experiencing difficulties whilst staying at work with the same firm

Age group (years)	None needed		Self-employed		Employer not told		Helped by mates		Change in job		Total	
	M	F	M	F	M	F	M	F	M	F	M	F
40–64.. ..	7	2	1	—	3	—	6	4	8	2	25	7
65–69.. ..	4(6)	1	4(6)	—	3(4)	—	1(1)	6	2(3)	—	14	7
70–79.. ..	8	1	—	—	—	1	3	1	—	1	11	4
All ages ..	19	4	5	—	6	1	10	11	10	3	50	18

(*c*) *The interval in years between cessation of regular employment and registration*

Age group (years)	One year		1 to 3 yr		3 to 10 yr		10 yr or more		Indefinite		Total	
	M	F	M	F	M	F	M	F	M	F	M	F
40–64 ..	14	10	6	4	—	4	—	1	2	—	22	19
65–69 ..	9	3	10(14)	4	4(9)	4	—	1	—	—	23	12
70–79 ..	6	—	5	2	10	2	1	3	—	—	22	7
All ages ..	29	13	21	10	14	10	1	5	2	—	67	38

Figures in parentheses (for males aged 40–64) are adjusted to a raised total of 50.

M=Males F=Females

TABLE III.E

The Causes of Blindness recorded in the Blind Certificate (BD8 forms) of the 288 subjects interviewed

Age Group (years)	Cataract		Senile macular degeneration		Glaucoma		Myopia		Diabetic retinopathy	
	M	F	M	F	M	F	M	F	M	F
40–64	2	3	3	1	4	5	3	6	8	22
65–69	2	1	3	8	8	1	5	5	3	16
70–79	3	3	23	19	9	8	5	5	4	4
	7	7	29	28	21	14	13	16	15	42

Age Group (years)	Iritis and iridocyclitis		Optic atrophy		*Other specified, including undiagnosed	
	M	F	M	F	M	F
40–64	—	3	7	2	24	10
65–69	—	1	—	—	14	18
70–79	—	1	—	—	6	10
	—	5	7	2	44	38

*Affections with less than 5 cases

M = Males F = Females

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